

=> fil reg

FILE 'REGISTRY' ENTERED AT 12:10:24 ON 16 JAN 2007

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STRUCTURE FILE UPDATES: 15 JAN 2007 HIGHEST RN 917470-98-5

DICTIONARY FILE UPDATES: 15 JAN 2007 HIGHEST RN 917470-98-5

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH June 30, 2006

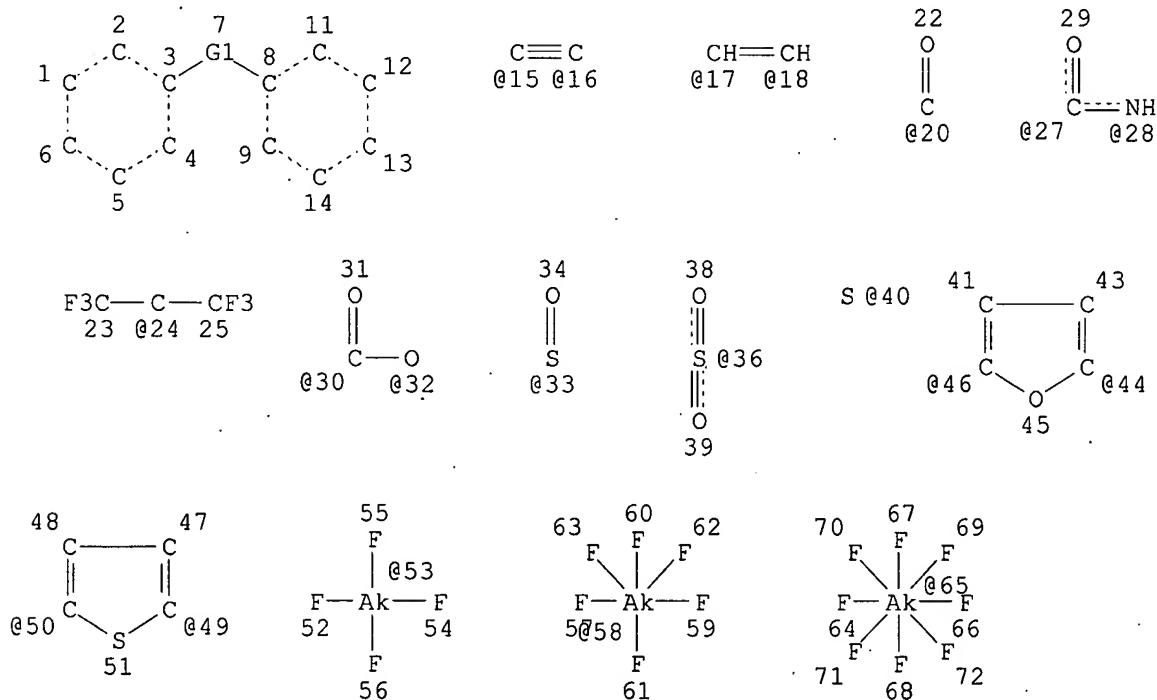
Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=> d sta que l35

L32 STR



VAR G1=20/24/27-3 28-8/30-3 32-8/33/36/O/40/15-3 16-8/17-3 18-8/50-3 49-8/46-3 44-8/CF2/53/58/65

NODE ATTRIBUTES:

CONNECT IS E3 RC AT 33

CONNECT IS E2 RC AT 40

CONNECT IS M1 RC AT 65
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RSPEC 4 8 43 47
 NUMBER OF NODES IS 65

STEREO ATTRIBUTES: NONE
 L33 SCR 1812
 L35 31026 SEA FILE=REGISTRY SSS FUL L32 AND L33

100.0% PROCESSED 51435 ITERATIONS (61 INCOMPLETE) 31026 ANSWERS
 SEARCH TIME: 00.00.10

=> d his

(FILE 'HCAPLUS' ENTERED AT 10:13:09 ON 16 JAN 2007)

```

      DEL HIS
L1      1 S US20040197632/PN OR (US2003-714394# OR JP2003-371047 OR JP200
      E SOHMA/AU
L2      20 S E12,E18
      E SOHMA NAME/AU
      E HIROSHI/AU
L3      14 S E3
      E HIROSHI S/AU
L4      1 S E3
      E HIROSHI NAME/AU
L5      5 S E4
      E IGUCHI/AU
      E IGUCHI M/AU
L6      62 S E3
L7      61 S E32
      E IGUCHI NAME/AU
L8      7 S E4
      E MASARU/AU
L9      5 S E33
      E KANAOKA/AU
L10     27 S E58-E60
      E NAGAYUKI/AU
      E KAJI/AU
      E KAJI H/AU
L11     171 S E3,E9
      E KAJI NAME/AU
L12     8 S E4
      E HAYATO/AU
L13     1 S E3
      E MORIKAWA/AU
      E MORIKAWA H/AU
L14     127 S E3
L15     190 S E42,E43
      E MORIKAWA NAME/AU
L16     7 S E4
      E HIROCHI/AU
      E MITSUTA/AU
L17     21 S E26
      E NAOKI/AU
L18     1 S E3

```

L19 1 S E35
 L20 3 S E50
 E HONDA/PA,CS
 L21 8137 S E3,E4 OR HONDA?/PA,CS
 L22 1 S L1 AND L2-L21
 L23 4 S (US20020164513 OR DE10201886 OR EP1245554 OR EP1329444)/PN
 L24 5 S L22,L23
 SEL RN

FILE 'REGISTRY' ENTERED AT 10:20:42 ON 16 JAN 2007

L25 28 S E1-E28
 L26 4 S L25 AND S/ELS
 L27 2 S (PLATINUM OR RHODIUM)/CN
 L28 1 S CARBON/CN
 L29 21 S L25 AND 46.150.18/RID NOT L26
 L30 11 S L29 AND PMS/CI
 L31 11 S L25,L29 NOT L26-L28,L30
 L32 STR
 L33 SCR 1812
 L34 50 S L32 AND L33 SAM
 L35 31026 S L32 AND L33 FUL
 SAV TEMP L35 LAURA714/A
 L36 28388 S L35 NOT PMS/CI
 L37 2638 S L35 NOT L36
 L38 319 S L37 AND 1/NC
 L39 297 S L38 NOT (C6-C6 OR C6-C6-C6)/ES
 L40 285 S L39 NOT NCNCNC/ES
 L41 260 S L40 NOT NC5-NC5-C6-C6/ES
 L42 251 S L41 NOT NITRILO
 L43 233 S L42 NOT PHTHALAZIN?
 L44 214 S L43 NOT (C2H4O OR C3H6O)
 L45 209 S L44 NOT NC5/ES
 L46 198 S L45 NOT 46.150.1/RID
 L47 196 S L46 NOT P/ELS
 L48 193 S L47 NOT NC5-C6-C6/ES
 L49 188 S L48 NOT N2C3/ES
 L50 185 S L49 NOT N2COC/ES
 L51 184 S L50 NOT NCNC2-C6/ES
 L52 178 S L51 NOT IMINOCARBONYLIMINO
 L53 174 S L52 NOT NC4-C6/ES
 L54 173 S L53 NOT IMINOCARBONOTHIOYLIMINO
 L55 166 S L54 NOT C5-C5/ES
 L56 165 S L55 NOT PROPEN?
 L57 150 S L56 NOT (SCSC2 OR NC4-NC4-C6 OR OSC3-C6 OR OC4-C6 OR C5-C6-C6
 L58 148 S L57 NOT (ZN OR CD)/ELS
 L59 19 S L58 AND (C24H16O8S2 OR C19H14O4S OR C20H18O10S2 OR C10H8O4 OR
 L60 19 S L58 AND (C24H28N2O8S2 OR C38H24O9S2 OR C30H28O7S2 OR C15H14O7
 L61 21 S L58 AND (C12H9NO15S6 OR C39H22F24N2O8S2 OR C14H14O8S3 OR C20H
 L62 2 S L61 AND C24H16O10S4
 L63 1 S 912548-45-9
 L64 90 S L58 NOT L59-L62
 L65 22 S L64 AND (C24H16O7S2 OR C20H15N3O8S2 OR C24H16O8S3 OR C33H26O1
 L66 22 S L64 AND (C27H22O10S3 OR C38H28O12S4 OR C18H12O4S OR C36H24O10
 L67 4 S L64 AND (C21H18O4S OR C28H22O9S2 OR C36H32O12S4)
 L68 49 S L64 NOT L65-L67
 L69 2318 S L37 NOT L38-L68,L26
 L70 1674 S L69 NOT (C6-C6 OR C6-C6-C6 OR NCNCNC OR NC5-NC5-C6-C6 OR NC5
 L71 1666 S L70 NOT (NCOC2-C6 OR N2SC2-C6-C6 OR NCSC2-C6 OR OC2-C6)/ES
 L72 1339 S L71 NOT (C2H4O OR C3H6O OR IMINOCARBONYLIMINO OR IMINOCARBONO
 L73 1177 S L72 NOT OC5-OC5-C6-C6/ES

L74 1036 S L73 NOT (80-05-7 OR 92-88-6)/CRN
L75 1031 S L74 NOT NC5-C6/ES
L76 1007 S L75 NOT (C19H14O4S OR C6H6O2)

FILE 'HCAPLUS' ENTERED AT 11:35:56 ON 16 JAN 2007

E FUEL CELL/CT
L77 1 S E3
L78 20218 S E4+OLD,NT OR E5+OLD,NT OR E6+OLD,NT OR E7 OR E8 OR E9+OLD,NT
E E13+ALL
L79 49647 S E6+OLD,NT
L80 69464 S FUEL CELL OR L77-L79
E FUEL CELL/CT
E E4+ALL
E EE14+ALL
E FUEL CELL/CT
E E4+ALL
E E14+ALL
L81 27 S L26,L63,L68
L82 959 S L76
L83 220 S L80 AND L81,L82
L84 35 S L83 AND (L27 OR ?PLATINUM? OR ?RHODIUM? OR PT OR RH)
E NOBLE METALS/CT
E E3+ALL
L85 28 S L83 AND E6+OLD,NT
L86 35 S L84,L85
L87 27 S L83 AND (L28 OR CARBON)
L88 23 S L83 AND ?LAYER?
L89 193 S L83 AND ?MEMBRAN?
L90 48 S L89 AND L86-L88
L91 34 S L1-L24 AND L83
E MEMBRANE/CT
E E22+ALL
L92 5058 S E4+OLD OR E6
L93 11 S L83 AND L92
L94 44 S L91,L93
L95 12 S L88 AND L94
L96 38 S L83 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)
L97 31 S L96 AND L84-L91,L93-L95
L98 2 S L91 AND L96
E SOMA/AU
L99 55 S E54
L100 18 S L99 AND L83
L101 1 S L100 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)
L102 31 S L98,L101,L97
SEL HIT RN

FILE 'REGISTRY' ENTERED AT 11:46:06 ON 16 JAN 2007

L103 85 S E1-E85
L104 79 S L103 AND L26,L63,L68,L76
L105 6 S L103 NOT L104
L106 5 S L104 AND L26,L63,L68
L107 74 S L104 NOT L106
L108 37 S L107 AND (C6H8N2O2 OR C10H14O2 OR C16H16CL2 OR C8H7F OR C16H1
L109 29 S L107 AND (C21H24CL2O4S OR C32H30O9S2 OR C17H20O2 OR C12H12N2O
L110 22 S L107 NOT L108,L109
L111 27 S L106,L110

FILE 'HCAPLUS' ENTERED AT 12:03:30 ON 16 JAN 2007

L112 29 S L111
L113 19 S L112 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)

L114 2 S L112 AND L1-L24,L99
L115 2 S L102 AND L1-L24
L116 3 S L114,L115
L117 7 S L24,L116
SEL RN

FILE 'REGISTRY' ENTERED AT 12:04:53 ON 16 JAN 2007

L118 37 S E86-E122
L119 6 S L118 AND L35
L120 31 S L118 NOT L119
L121 19 S L120 AND C6/ES AND NR>=2
L122 2 S L120 AND (PT OR RH)/ELS
L123 10 S L120 NOT L119,L121,L122
L124 18 S L121 NOT C12H100

FILE 'HCAPLUS' ENTERED AT 12:07:32 ON 16 JAN 2007

L125 7 S L117 AND L119,L122,L123,L124
L126 18 S L113 NOT L117
L127 16 S L125,L126 AND L77-L80
L128 0 S L125,L126 AND L92
L129 24 S L125,L126,L127 AND (?LAYER? OR ?MEMBRAN? OR L27 OR L122 OR ?P
L130 23 S L129 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)
L131 1 S L129 NOT L130
L132 24 S L129-L131

FILE 'REGISTRY' ENTERED AT 12:10:24 ON 16 JAN 2007

=> fil hcaplus

FILE 'HCAPLUS' ENTERED AT 12:10:36 ON 16 JAN 2007

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FILE COVERS 1907 - 16 Jan 2007 VOL 146 ISS 4

FILE LAST UPDATED: 15 Jan 2007 (20070115/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d l132 bib abs hitind hitstr retable tot

L132 ANSWER 1 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2005:1132936 HCAPLUS

DN 143:406557

TI Ion-conductive copolymers containing one or more hydrophobic oligomers

IN Chen, Jian Ping

PA Polyfuel, Inc., USA

SO U.S. Pat. Appl. Publ., 38 pp., Cont.-in-part of U.S. Ser. No. 438,299.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 6

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005234146	A1	20051020	US 2004-987951	20041112 <--
	US 2004126666	A1	20040701	US 2003-438299	20030513 <--
	US 7094490	B2	20060822		
	US 2006135657	A1	20060622	US 2006-350228	20060207 <--
PRAI	US 2002-381136P	P	20020513	<--	
	US 2003-438299	A2	20030513		
	US 2003-520266P	P	20031113		
	US 2004-545293P	P	20040217		
	US 2003-449299P	P	20030220		

AB In one aspect, the invention provides ion conductive copolymers comprising (1) a plurality of first oligomers, (2) a plurality of second oligomers, (3) ion conductive monomers and (4) linking monomers. The oligomers preferably are hydrophobic and together with the ion conductive monomers are randomly dispersed between the linking monomers. Uses of such polymeric materials include the formation of polymer electrolyte **membranes** (PEMs), catalyst coated **membranes** (CCM's) and **membrane** electrolyte assemblies (MEA's) which may be used in **fuel cells** and the like. An ion-conducting copolymer was prepared from a 9,9-bis(4-hydroxyphenyl)fluorene-4,4'-difluorobenzophenone oligomer.

IC ICM C08G0002-00

INCL 522090000

CC 37-3 (Plastics Manufacture and Processing)

ST ion conducting block polar polyether **membrane**

IT **Fuel cells**

Polymerization

(ion-conductive copolymers containing one or more hydrophobic oligomers)

IT Ion exchange **membranes**

(proton exchange; ion-conductive copolymers containing one or more hydrophobic oligomers)

IT 40793-56-4P, 9,9-Bis(4-hydroxyphenyl)fluorene-4,4'-difluorobenzophenone

copolymer 690662-65-8P 690662-70-5P 690662-71-6P 690662-72-7P

690662-75-0P 690662-76-1P 690662-79-4P **690662-81-8P**

690662-82-9P 690663-41-3P 867044-45-9P 867044-46-0P 867044-47-1P

867044-48-2P 867044-49-3P 867044-50-6P 867044-51-7P 867044-52-8P

RL: IMF (Industrial manufacture); PREP (Preparation)

(ion-conductive copolymers containing one or more hydrophobic oligomers)

IT **690662-81-8P**

RL: IMF (Industrial manufacture); PREP (Preparation)

(ion-conductive copolymers containing one or more hydrophobic oligomers)

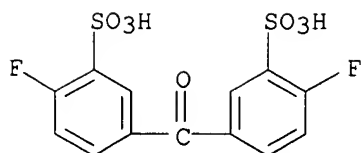
RN 690662-81-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, polymer with bis(4-fluorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 625392-06-5

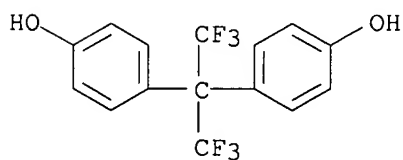
CMF C13 H8 F2 O7 S2



CM 2

CRN 1478-61-1

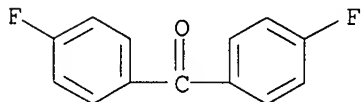
CMF C15 H10 F6 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



L132 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2005:1103231 HCAPLUS

DN 143:389771

TI Polymer electrolyte **fuel cell**

IN Fukuda, Kaoru; Eguchi, Taku; Tsuji, Makoto

PA **Honda Motor Co., Ltd, Japan**

SO U.S. Pat. Appl. Publ., 10 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005227138	A1	20051013	US 2005-98425	<u>20050405</u>
	JP 2005302339	A	20051027	JP 2004-112673	20040407
PRAI	JP 2004-112673	A	20040407		

AB A polymer electrolyte **fuel cell** consists of plural units, and the unit has an anode side separator, an anode diffusion **layer**, an anode catalytic **layer**, polymer electrolyte **membrane**, a cathode catalytic **layer**, a cathode diffusion **layer**, and a cathode side separator. The cathode catalytic **layer** further includes a catalyst in which **platinum** or

platinum alloy is supported on a carbon supporting body having an average lattice space of [002] surface of 0.338 to 0.355 nm and sp. surface area of the supporting body of 80 to 250 m²/g, electrolyte containing ion exchange resin, and vapor grown carbon fiber. Furthermore, a water holding **layer** containing ion exchange resin, carbon particles, and vapor grown carbon fiber is arranged at an interface of the cathode diffusion **layer** and the cathode catalytic **layer**.

IC ICM H01M0004-94
ICS H01M0004-96; H01M0008-10
INCL 429042000; 429044000; 429033000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST polymer electrolyte **fuel cell**
IT Catalysts
(electrocatalysts; polymer electrolyte **fuel cell**)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; polymer electrolyte **fuel cell**)
IT Polyketones
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyether-, fluorine-containing, sulfo group-containing; polymer electrolyte **fuel cell**)
IT Fluoropolymers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyether-polyketone-, sulfo group-containing; polymer electrolyte **fuel cell**)
IT Polyethers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyketone-, fluorine-containing, sulfo group-containing; polymer electrolyte **fuel cell**)
IT **Fuel cell electrolytes**
Ion exchangers
(polymer electrolyte **fuel cell**)
IT Graphitized carbon black
RL: CAT (Catalyst use); USES (Uses)
(polymer electrolyte **fuel cell**)
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polymer electrolyte **fuel cell**)
IT **Fuel cells**
(polymer electrolyte; polymer electrolyte **fuel cell**)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; polymer electrolyte **fuel cell**)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; polymer electrolyte **fuel cell**)
IT Carbon fibers, uses
RL: DEV (Device component use); USES (Uses)
(vapor-grown; polymer electrolyte **fuel cell**)
IT **Platinum** alloy, base

RL: CAT (Catalyst use); USES (Uses)
 (polymer electrolyte **fuel cell**)
 IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (particles; polymer electrolyte **fuel cell**)
 IT 7440-06-4, Platinum, uses 12779-05-4
 501004-25-7, TEC 61E54
 RL: CAT (Catalyst use); USES (Uses)
 (polymer electrolyte **fuel cell**)
 IT 163294-14-2, Nafion 112 582300-03-6, Nafion SE 20192
 796851-46-2, Nafion DE 2020
 RL: DEV (Device component use); USES (Uses)
 (polymer electrolyte **fuel cell**)
 IT 663920-27-2DP, hydrolyzed
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (polymer electrolyte **fuel cell**)
 IT 69266-28-0P 663920-23-8P 663920-24-9P
 663920-25-0P 663920-27-2P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (polymer electrolyte **fuel cell**)
 IT 864442-38-6, Nafion DE 2021
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polymer electrolyte **fuel cell**)
 IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (particles; polymer electrolyte **fuel cell**)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7440-06-4, Platinum, uses 12779-05-4
 501004-25-7, TEC 61E54
 RL: CAT (Catalyst use); USES (Uses)
 (polymer electrolyte **fuel cell**)
 RN 7440-06-4 HCAPLUS
 CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 12779-05-4 HCAPLUS
 CN Platinum alloy, nonbase, Pt,Ru (9CI) (CA INDEX NAME)

Component	Component Registry Number
Pt	7440-06-4
Ru	7440-18-8

Pt	7440-06-4
Ru	7440-18-8

RN 501004-25-7 HCAPLUS
 CN TEC 61E54 (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 163294-14-2, Nafion 112 582300-03-6, Nafion SE 20192
 796851-46-2, Nafion DE 2020

RL: DEV (Device component use); USES (Uses)
(polymer electrolyte **fuel cell**)

RN 163294-14-2 HCAPLUS

CN Nafion 112 (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 582300-03-6 HCAPLUS

CN Nafion SE 20192 (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 796851-46-2 HCAPLUS

CN Nafion DE 2020 (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **663920-27-2DP**, hydrolyzed

RL: DEV (Device component use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(polymer electrolyte **fuel cell**)

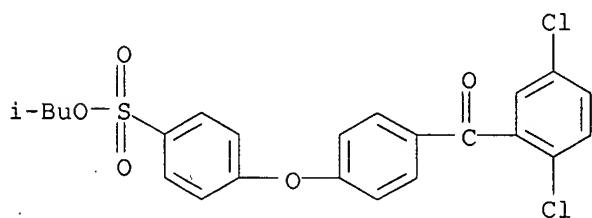
RN 663920-27-2 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 2-methylpropyl
ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-
1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 663920-25-0

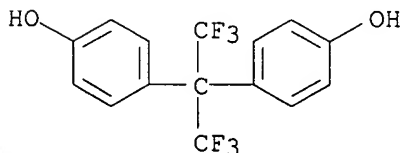
CMF C23 H20 Cl2 O5 S



CM 2

CRN 1478-61-1

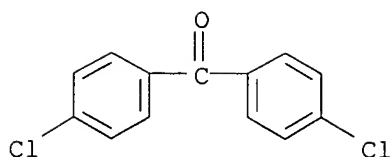
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



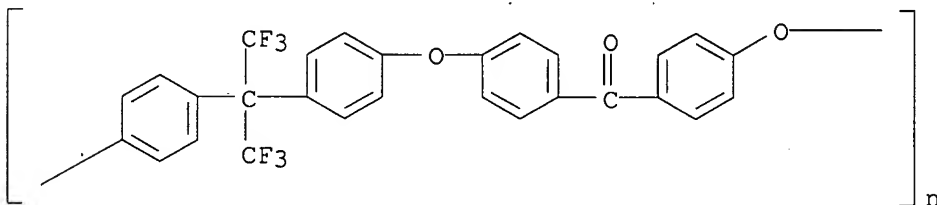
IT 69266-28-0P 663920-23-8P 663920-24-9P

663920-25-0P 663920-27-2P

RL: SPN (Synthetic preparation); PREP (Preparation)
(polymer electrolyte **fuel cell**)

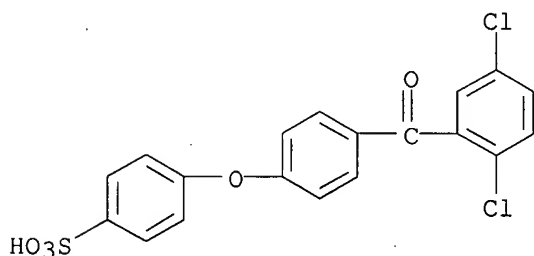
RN 69266-28-0 HCAPLUS

CN Poly[oxy-1,4-phenylenecarbonyl-1,4-phenyleneoxy-1,4-phenylene[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]-1,4-phenylene] (9CI) (CA INDEX NAME)



RN 663920-23-8 HCAPLUS

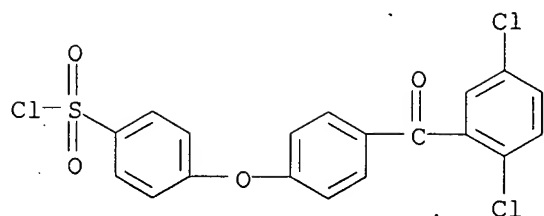
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt
(9CI) (CA INDEX NAME)



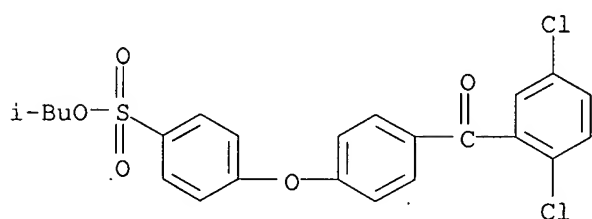
● Na

RN 663920-24-9 HCAPLUS

CN Benzenesulfonyl chloride, 4-[4-(2,5-dichlorobenzoyl)phenoxy]- (9CI) (CA INDEX NAME)



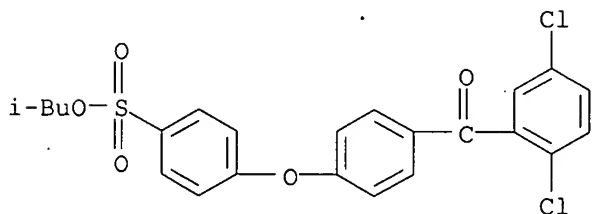
RN 663920-25-0 HCAPLUS
 CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 2-methylpropyl ester (9CI) (CA INDEX NAME)



RN 663920-27-2 HCAPLUS
 CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 2-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

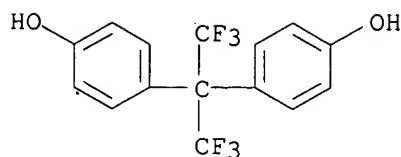
CM 1

CRN 663920-25-0
 CMF C23 H20 Cl2 O5 S



CM 2

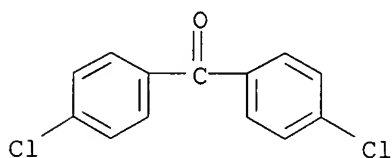
CRN 1478-61-1
 CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 C12 O



IT 864442-38-6, Nafion DE 2021

RL: TEM (Technical or engineered material use); USES (Uses)
(polymer electrolyte **fuel cell**)

RN 864442-38-6 HCAPLUS

CN Nafion DE 2021 (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

L132 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2005:824448 HCAPLUS

DN 143:232677

TI Ion conductive random copolymers for electrolyte **membranes** in
fuel cellsIN Cao, Shuguang; Chen, Jian Ping; Jeanes, Thomas; Nam, Kie Hyun; Olmeijer,
David; Xu, Helen

PA USA

SO U.S. Pat. Appl. Publ., 17 pp., Cont.-in-part of U.S. Ser. No. 438,186.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 6

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005181256	A1	20050818	US 2004-987178	<u>20041112</u> <--
	US 2004039148	A1	20040226	US 2003-438186	<u>20030513</u> <--
	US 2006135657	A1	20060622	US 2006-350228	20060207 <--
PRAI	US 2002-381136P	P	20020514	<--	
	US 2002-426540P	P	20021115	<--	
	US 2003-446395P	P	20030210		
	US 2003-438186	A2	20030513		
	US 2003-449299P	P	20030220		
	US 2003-438299	A3	20030513		

AB This invention relates to ion conducting random copolymers that are useful in forming polymer electrolyte **membranes** used in **fuel cells**. A catalyst-coated **membrane** comprises a proton exchange **membrane** where all or part of ≥ 1 of the opposing

surface of the **membrane** comprises a catalyst **layer**.

IC ICM H01M0008-00
 INCL 429033000; X42-931.4; X42-931.7; X52-628.7; X52-631.6; X52-630.75
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST copolymer electrolyte **membranes fuel cell**
 IT **Membranes**, nonbiological
 (catalyst-coated; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT Polymers, uses
 RL: DEV (Device component use); USES (Uses)
 (co-; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT Electric motors
 Fuel cell electrolytes
 (ion conductive random copolymers for electrolyte **membranes**
 in **fuel cells**)
 IT Polyketones
 RL: DEV (Device component use); USES (Uses)
 (polyether-; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT Polythioethers
 RL: DEV (Device component use); USES (Uses)
 (polyether-polysulfone-; ion conductive random copolymers for
 electrolyte **membranes in fuel cells**)
 IT Polysulfones, uses
 RL: DEV (Device component use); USES (Uses)
 (polyether-polythioether-; ion conductive random copolymers for
 electrolyte **membranes in fuel cells**)
 IT Polyethers, uses
 RL: DEV (Device component use); USES (Uses)
 (polyketone-; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT Polythioethers
 RL: DEV (Device component use); USES (Uses)
 (polysulfone-; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT Polyethers, uses
 RL: DEV (Device component use); USES (Uses)
 (polysulfone-polythioether-; ion conductive random copolymers for
 electrolyte **membranes in fuel cells**)
 IT Polysulfones, uses
 RL: DEV (Device component use); USES (Uses)
 (polythioether-; ion conductive random copolymers for electrolyte
 membranes in fuel cells)
 IT **Fuel cells**
 (proton exchange **membrane**; ion conductive random copolymers
 for electrolyte **membranes in fuel cells**)
 IT 210531-46-7P **334658-51-4P 474242-19-8P**
 737611-77-7P 862772-88-1P 862772-89-2P 862772-90-5P
 862772-91-6P 862772-92-7P 862772-93-8P 862772-94-9P 862772-95-0P
 862772-96-1P 862772-97-2P **862772-98-3P** 862772-99-4P
 862773-00-0P 862773-01-1P 862773-02-2P 862773-03-3P 862773-04-4P
 862773-05-5P 862773-06-6P **862773-07-7P** 862773-08-8P
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (ion conductive random copolymers for electrolyte **membranes**
 in **fuel cells**)
 IT **334658-51-4P 474242-19-8P 737611-77-7P**
 862772-98-3P 862773-07-7P

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (ion conductive random copolymers for electrolyte **membranes** in **fuel cells**)

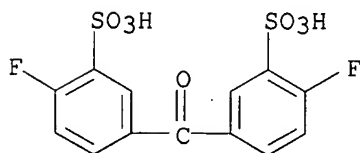
RN 334658-51-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer with bis(4-fluorophenyl)methanone and 4,4'-thiobis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

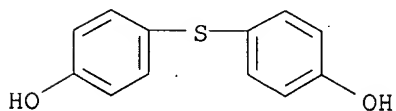


● 2 Na

CM 2

CRN 2664-63-3

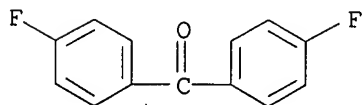
CMF C12 H10 O2 S



CM 3

CRN 345-92-6

CMF C13 H8 F2 O

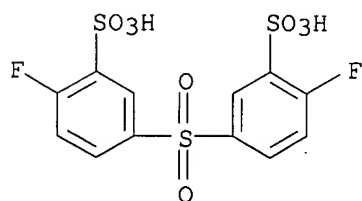


RN 474242-19-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, polymer with 1,1'-sulfonylbis[4-fluorobenzene] and 4,4'-thiobis[benzenethiol] (9CI) (CA INDEX NAME)

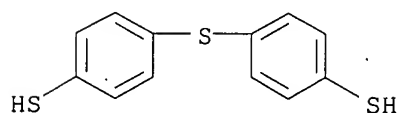
CM 1

CRN 474242-18-7
CMF C12 H8 F2 O8 S3



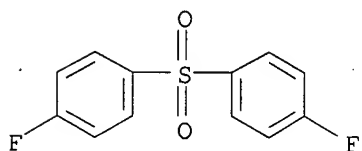
CM 2

CRN 19362-77-7
CMF C12 H10 S3



CM 3

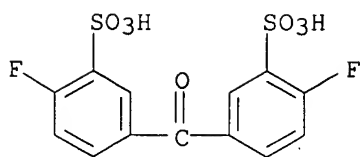
CRN 383-29-9
CMF C12 H8 F2 O2 S



RN 737611-77-7 HCAPLUS
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer
with bis(4-fluorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-
(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6
CMF C13 H8 F2 O7 S2 . 2 Na

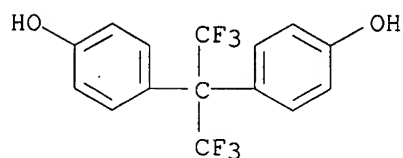


● 2 Na

CM 2

CRN 1478-61-1

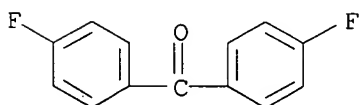
CMF C15 H10 F6 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



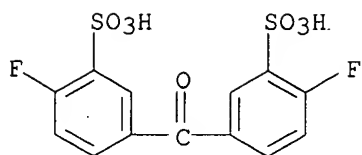
RN 862772-98-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer with bis(4-fluorophenyl)methanone, 4,4'-oxybis[phenol] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethyldiene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

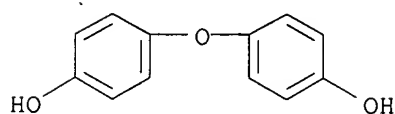


● 2 Na

CM 2

CRN 1965-09-9

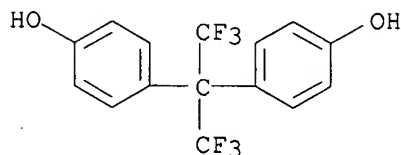
CMF C12 H10 O3



CM 3

CRN 1478-61-1

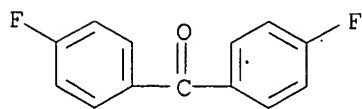
CMF C15 H10 F6 O2



CM 4

CRN 345-92-6

CMF C13 H8 F2 O

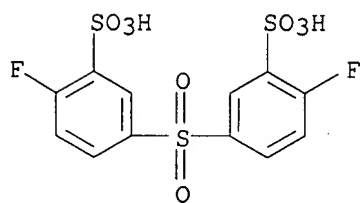


RN 862773-07-7 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, polymer with
1,4-dichloro-2-(phenylsulfonyl)benzene, 1,1'-sulfonylbis[4-fluorobenzene]
and 4,4'-thiobis[benzenethiol] (9CI) (CA INDEX NAME)

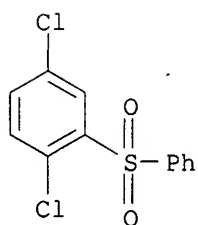
CM 1

CRN 474242-18-7
CMF C12 H8 F2 O8 S3



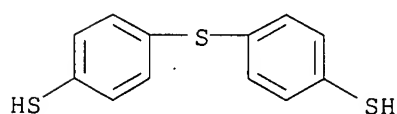
CM 2

CRN 38346-45-1
CMF C12 H8 C12 O2 S



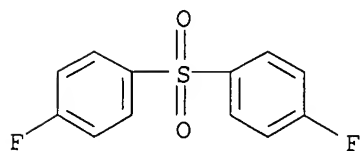
CM 3

CRN 19362-77-7
CMF C12 H10 S3



CM 4

CRN 383-29-9
CMF C12 H8 F2 O2 S



AN 2005:123117 HCAPLUS
 DN 142:222572
 TI Composite solid polymer electrolyte **membranes** for use in
 electrochemical applications
 IN Ofer, David; Nair, Bindu R.; Stoler, Emily J.; Kovar, Robert F.
 PA Foster-Miller Inc., USA
 SO U.S. Pat. Appl. Publ., 32 pp., Cont.-in-part of U.S. Ser. No. 750,402.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005031925	A1	20050210	US 2004-851478	<u>20040522</u> <--
	US 2002045085	A1	20020418	US 2000-750402	<u>20001228</u> <--
	US 7052793	B2	20060530		
	WO 2006073474	A2	20060713	WO 2005-US18105	20050520
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,				
	CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,				
	GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ,				
	LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA,				
	NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK,				
	SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU,				
	ZA, ZM, ZW				
	RW:				
	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,				
	IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF,				
	CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM,				
	KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG,				
	KZ, MD, RU, TJ, TM				
PRAI	US 1999-261397	A3	19990303	<--	
	US 2000-750402	A2	20001228	<--	
	US 1997-57233P	P	19970829	<--	
	US 1999-261349	A3	19990303	<--	
	US 2004-851478	A	20040522		
AB	The present invention relates to composite solid polymer electrolyte membranes (SPEMs) which include a porous polymer substrate interpenetrated with a water soluble ion-conducting material. SPEMs of the present invention are useful in electrochem. applications, including fuel cells and electrodialysis.				
IC	ICM H01M0008-10				
	ICS H01M0008-00; H01M0006-18				
INCL	429030000; 429033000; 429314000				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
	Section cross-reference(s): 38, 72				
ST	polymer electrolyte membrane use electrochem application; fuel cell polymer electrolyte membrane ; electrodialysis polymer electrolyte membrane				
IT	Polyamide fibers, uses				
	RL: TEM (Technical or engineered material use); USES (Uses) (aramid; composite solid polymer electrolyte membranes for use in electrochem. applications)				
IT	Polymers, uses				
	RL: DEV (Device component use); USES (Uses) (aromatic, ion conductive; composite solid polymer electrolyte membranes for use in electrochem. applications)				
IT	Polyamides, uses				
	Polyketones				
	Polysulfones, uses				
	RL: DEV (Device component use); USES (Uses) (aromatic, sulfonated; composite solid polymer electrolyte				

membranes for use in electrochem. applications)
IT Polyimides, uses
RL: DEV (Device component use); USES (Uses)
(carboxylated and phosphonated and sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Electrochemical cells
Fuel cell electrolytes
Polymer electrolytes
Sulfonation
(composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polybenzoxazoles
RL: DEV (Device component use); USES (Uses)
(composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polybenzimidazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polybenzothiazoles
RL: TEM (Technical or engineered material use); USES (Uses)
(composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Dialyzers
(electrodialyzers, **membranes**; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(fluoropolymers; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(ionomers; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Liquid crystals, polymeric
(lyotropic; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(partially fluorinated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Synthetic polymeric fibers, uses
RL: DEV (Device component use); USES (Uses)
(polybenzazole, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(polyether-, aromatic, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polyketones
Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(polyether-, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)
IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)

(polyketone-, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Sulfonic acids, uses
 RL: DEV (Device component use); USES (Uses)
 (polymers, fluoro; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Fluoropolymers, uses
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Ionomers
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polysulfones, uses
 RL: DEV (Device component use); USES (Uses)
 (polyphenyl-, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polyquinoxalines
 RL: DEV (Device component use); USES (Uses)
 (polyphenylquinoxalines, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polyethers, uses
 RL: DEV (Device component use); USES (Uses)
 (polysulfone-, aromatic, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polyethers, uses
 Polyphenyls
 RL: DEV (Device component use); USES (Uses)
 (polysulfone-, sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polymers, uses
 RL: DEV (Device component use); USES (Uses)
 (sulfo-containing, fluoro; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT Polyoxyphenylenes
 Polysulfones, uses
 RL: DEV (Device component use); USES (Uses)
 (sulfonated; composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT 9003-01-4, Polyacrylic acid 26101-52-0, Polyvinyl sulfonic acid 27754-99-0, Polyvinyl phosphonic acid 50851-57-5, Polystyrene sulfonic acid 63496-24-2, Nafion EW 1100
 RL: DEV (Device component use); USES (Uses)
 (composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT 686768-99-0P 843614-17-5P
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT 3177-22-8P 25135-51-7P 25667-42-9DP, Ultrason E, sulfonated 154281-38-6DP, Radel R, sulfonated 220998-11-8P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT 25035-37-4, Poly(1,4-phenyleneterephthalamide)
 RL: TEM (Technical or engineered material use); USES (Uses)
 (composite solid polymer electrolyte **membranes** for use in electrochem. applications)

IT 686768-99-0P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(composite solid polymer electrolyte **membranes** for use in electrochem. applications)

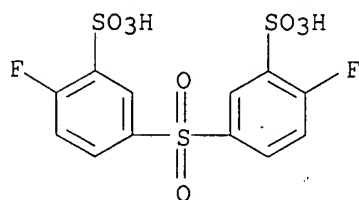
RN 686768-99-0 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, polymer with 4,4'-thiobis[benzenethiol] (9CI) (CA INDEX NAME)

CM 1

CRN 474242-18-7

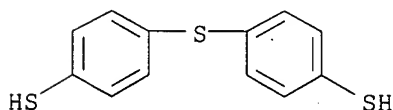
CMF C12 H8 F2 O8 S3



CM 2

CRN 19362-77-7

CMF C12 H10 S3



L132 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:510188 HCAPLUS

DN 141:54792

TI Aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromolecular solid electrolyte, and proton conductive **membrane**

IN Kanaoka, Nagayuki; Iguchi, Masaru; Mitsuta, Naoki; Soma, Hiroshi; Ohtsuki, Toshihiro

PA JSR Corporation, Japan; Honda Motor Co., Ltd.

SO Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DT Patent

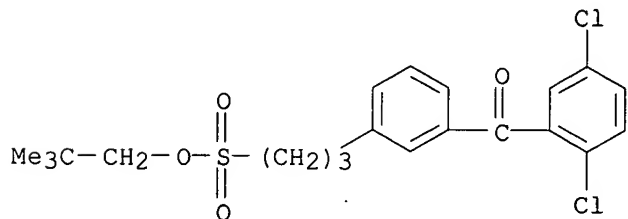
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1431281	A1	20040623	EP 2003-28999	20031217 <--
	EP 1431281	B1	20060510		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	JP 2004196947	A	20040715	JP 2002-367042	20021218 <--
	US 2004126639	A1	20040701	US 2003-734194	20031215 <--

US 7078121 B2 20060718
PRAI JP 2002-367042 A 20021218 <--
OS MARPAT 141:54792
AB Described herein is a production method of sulfonated polyarylene that is safe and enables easy control of the amount and position of sulfonic groups introduced in the polymer. The sulfonated polyarylene is also disclosed. The invention further provides a polyarylene and an aromatic sulfonate derivative
that are suitably employed in the above production method. Also provided are a macromol. solid electrolyte that comprises the sulfonated polyarylene, and a proton conductive **membrane**. The aromatic sulfonate derivative has the formula $X_2C_6H_3YC_6H_4ASO_2R$, wherein X is a halogen atom other than fluorine, a $-OSO_3CH_3$ group or a $-OSO_3CF_3$ group; Y is a divalent organic group; A is $-(CH_2)_m-$ or $-(CF_2)_m-$ (wherein m is an integer of 1 to 10); and R is a C4-20 hydrocarbon group. The production method of sulfonated polyarylene comprises coupling polymerization of an aromatic compound that includes at least the aromatic sulfonate derivative and hydrolysis of the resultant polyarylene.
IC ICM C07C0309-67
ICS C08G0061-10; C08G0061-12; H01M0010-40
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 52
ST arom sulfonate polymer proton conductive **membrane fuel cell**
IT Sulfonic acids, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(arenesulfonic, salts; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
IT **Fuel cells**
Hydrolysis
Polymer electrolytes
(aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
IT Polymerization
(coupling; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
IT Polyketones
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyether-, fluorine-containing, oligomeric; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
IT Fluoropolymers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyether-polyketone-, oligomeric; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
IT Polyethers, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyketone-, fluorine-containing, oligomeric; aromatic sulfonate derivative,

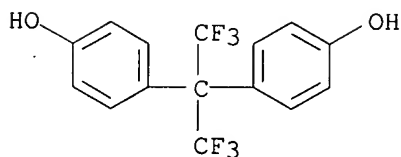
- polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT **Membranes**, nonbiological
(proton conductive; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT Aromatic compounds
RL: IMF (Industrial manufacture); PREP (Preparation)
(sulfonates; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT **705967-34-6P**
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT **705967-34-6DP**, hydrolyzed
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT **69266-28-0P 122325-09-1P**, Bisphenol AF-4,4'-dichlorobenzophenone copolymer
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(oligomeric; aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- IT **705967-34-6P**
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production method thereof, macromol. solid electrolyte, and proton conductive **membrane**)
- RN 705967-34-6 HCAPLUS
- CN Benzenepropanesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)
- CM 1
- CRN 705967-33-5
- CMF C21 H24 Cl2 O4 S



CM 2

CRN 1478-61-1

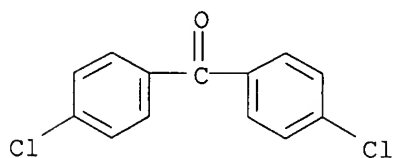
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IT 705967-34-6DP, hydrolyzed

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(aromatic sulfonate derivative, polyarylene, sulfonated polyarylene and production

method thereof, macromol. solid electrolyte, and proton conductive membrane)

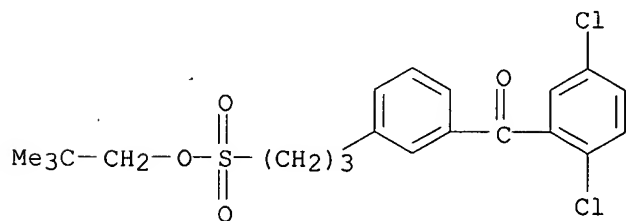
RN 705967-34-6 HCAPLUS

CN Benzenepropanesulfonic acid, 3-(2,5-dichlorobenzoyl)-, 2,2-dimethylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethyldiene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

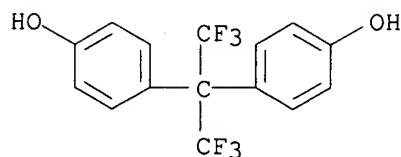
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CMF C21 H24 Cl2 O4 S



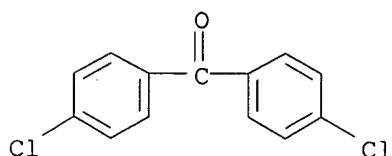
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CRN 1478-61-1
CMF C15 H10 F6 O2

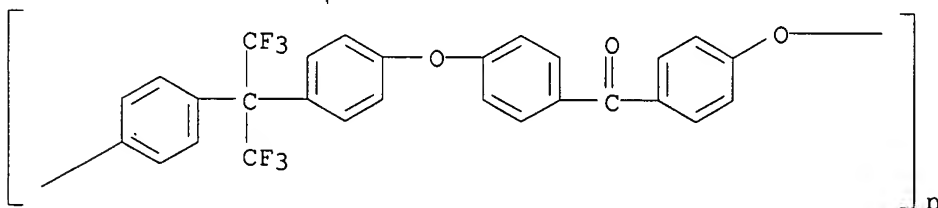


CM 3

CRN 90-98-2
CMF C13 H8 Cl2 O



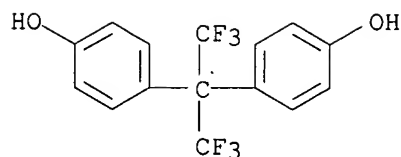
IT 69266-28-0P 122325-09-1P, Bisphenol AF-4,4'-
dichlorobenzophenone copolymer
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(oligomeric; aromatic sulfonate derivative, polyarylene, sulfonated
polyarylene and production method thereof, macromol. solid electrolyte, and
proton conductive **membrane**)
RN 69266-28-0 HCAPLUS
CN Poly[oxy-1,4-phenylenecarbonyl-1,4-phenyleneoxy-1,4-phenylene[2,2,2-
trifluoro-1-(trifluoromethyl)ethylidene]-1,4-phenylene] (9CI) (CA INDEX
NAME)



RN 122325-09-1 HCAPLUS
CN Methanone, bis(4-chlorophenyl)-, polymer with 4,4'-[2,2,2-trifluoro-1-
(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

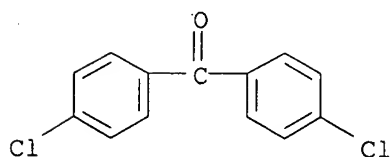
CRN 1478-61-1
CMF C15 H10 F6 O2



CM 2

CRN 90-98-2

CMF C13 H8 C12 O



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Jsr Corp	2001			EP 1138712 A	HCAPLUS
Jsr Corp	2002			EP 1245554 A	HCAPLUS
Jsr Corp	2002			EP 1245555 A	HCAPLUS
Rikukawa, M	1995			US 5403675 A	HCAPLUS

L132 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:414812 HCAPLUS

DN 140:409658

TI Ion conductive block copolymers for polymer electrolyte **membrane**
fuel cells

IN Xu, Helen; Cao, Shuguang; Chen, Jingping; Jeanes, Thomas; Nam, Kie Hyun

PA Polyfuel, Inc., USA

SO PCT Int. Appl., 53 pp.

CODEN: PIXXD2

DT Patent

LA English

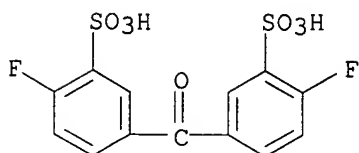
FAN.CNT 6

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004042839	A2	20040521	WO 2003-US15351	20030513 <--
	WO 2004042839	A3	20050127		
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	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	CA 2485971	A1	20040521	CA 2003-2485971	20030513 <--
	AU 2003299502	A1	20040607	AU 2003-299502	20030513 <--

EP 1518290 A2 20050330 EP 2003-799789 20030513 <--
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK
 CN 1669169 A 20050914 CN 2003-816347 20030513 <--
 JP 2006512428 T 20060413 JP 2004-549894 20030513 <--
 US 2006135657 A1 20060622 US 2006-350228 20060207 <--
 PRAI US 2002-381136P P 20020514 <--
 US 2003-449299P P 20030220
 US 2003-438299 A3 20030513
 WO 2003-US15351 W 20030513
 AB This invention relates to ion conductive copolymers which are useful in
 forming polymer electrolyte **membranes** used in **fuel**
cells. In a catalyst coated **membrane**, at least one of
 the opposing surfaces of the **membrane** comprises a catalyst
layer.
 IC ICM H01M
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST **fuel cell membrane** ion conductive block
 copolymer
 IT Polymers, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (block; ion conductive block copolymers for polymer electrolyte
membrane fuel cells)
 IT Electric conductivity
Fuel cell electrolytes
 Secondary battery separators
 Swelling, physical
 (ion conductive block copolymers for polymer electrolyte
membrane fuel cells)
 IT **Fuel cells**
 (solid electrolyte; ion conductive block copolymers for polymer
 electrolyte **membrane fuel cells**)
 IT 584-08-7P, Potassium carbonate 25897-65-8P, Bisphenol
 A-4,4'-difluorobenzophenone copolymer 40793-56-4P, 9,9-Bis(4-
 hydroxyphenyl)fluorene-4,4'-difluorobenzophenone copolymer 69254-20-2P
 117344-37-3P 125938-56-9P 193410-35-4P, 4,4'-Difluorobenzophenone-4,4'-
 dihydroxydiphenyl ether copolymer 625392-07-6P 690662-65-8P
 690662-66-9P 690662-67-0P 690662-68-1P 690662-69-2P 690662-70-5P
 690662-71-6P 690662-72-7P 690662-73-8P 690662-74-9P 690662-75-0P
 690662-76-1P 690662-77-2P 690662-78-3P 690662-79-4P 690662-80-7P
690662-81-8P 690662-82-9P 690663-41-3P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (ion conductive block copolymers for polymer electrolyte
membrane fuel cells)
 IT 67-56-1, Methanol, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (ion conductive block copolymers for polymer electrolyte
membrane fuel cells)
 IT **690662-81-8P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (ion conductive block copolymers for polymer electrolyte
membrane fuel cells)
 RN 690662-81-8 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, polymer with
 bis(4-fluorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-
 (trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

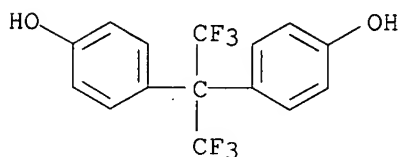
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CRN 625392-06-5
CMF C13 H8 F2 O7 S2



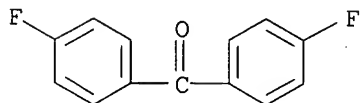
CM 2

CRN 1478-61-1
CMF C15 H10 F6 O2



CM 3

CRN 345-92-6
CMF C13 H8 F2 O

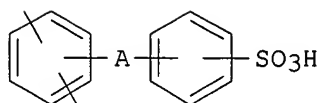


L132 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:402980 HCAPLUS
DN 140:409627
TI Electrode structure for polymer electrolyte fuel cells
IN Sohma, Hiroshi; Iguchi, Masaru; Kanaoka,
Nagayuyki; Kaji, Hayato; Morikawa, Hiroshi;
Mitsuta, Naoki
PA Honda Motor Co., Ltd., Japan
SO Eur. Pat. Appl., 26 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1420473	A1	20040519	EP 2003-26194	20031117 <--
	EP 1420473	B1	20060412		
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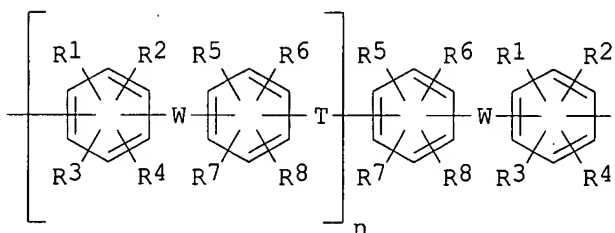
US 2004197632	A1	20041007	US 2003-714394	20031117 <--
JP 2005158265	A	20050616	JP 2003-387362	20031118 <--
PRAI JP 2002-333143	A	20021118	<--	
JP 2003-371047	A	20031030	<--	

GI



I

Applicant



II

AB The present invention provides an electrode structure for polymer electrolyte **fuel cells**, inexpensive, and exhibiting excellent power production capacity and durability even under high temperature/low humidity conditions, and also provides a polymer electrolyte **fuel cell** which incorporates the same electrode structure. The present invention also provides an elec. device and transportation device, each incorporating the same polymer electrolyte **fuel cell**. The electrode structure comprises a pair of electrode catalyst **layers**, each containing a catalyst supported by **carbon** particles, and polymer electrolyte **membrane** placed between these electrode catalyst **layers**. The polymer electrolyte **membrane** is of a sulfonated polyarylene composed of 0.5 to 100% by mol of the first repeating unit represented by (I) and 0 to 99.5% by mol of the second repeating unit represented by (II): (wherein, A is a divalent organic group; and a benzene ring includes its derivative; -W- is a divalent electron attracting group; -T- is a divalent organic group; and R1 to R8 are a hydrogen atom or fluorine atom, an alkyl group, fluorine-substituted alkyl group, allyl group, aryl group or cyano group, and may be the same or different).

IC ICM H01M0008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38ST electrode structure polymer electrolyte **fuel cell**

IT Catalysts

(electrocatalysts; electrode structure for polymer electrolyte **fuel cells**)IT **Fuel cell electrodes**(electrode structure for polymer electrolyte **fuel cells**)IT **Noble metals**

RL: CAT (Catalyst use); USES (Uses)

(electrode structure for polymer electrolyte **fuel cells**)

IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

IT Polyoxyalkylenes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (fluorine- and sulfo-containing, ionomers; electrode structure for polymer electrolyte **fuel cells**)

IT Fluoropolymers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers; electrode structure for polymer electrolyte **fuel cells**)

IT Ionomers
 RL: MOA (Modifier or additive use); USES (Uses)
 (polyoxyalkylenes, fluorine- and sulfo-containing; electrode structure for polymer electrolyte **fuel cells**)

IT **Fuel cells**
 (solid electrolyte; electrode structure for polymer electrolyte **fuel cells**)

IT **7440-06-4, Platinum**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

IT **690247-89-3D**, ester hydrolysis products
 RL: DEV (Device component use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

IT **9002-84-0, Ptfе**
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

IT **122325-09-1P 663920-23-8P**, Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt **663920-24-9P**, 4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride **690247-88-2P 690247-89-3P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (electrode structure for polymer electrolyte **fuel cells**)

IT **7440-44-0, Carbon**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support; electrode structure for polymer electrolyte **fuel cells**)

IT **7440-06-4, Platinum**, uses
 RL: CAT (Catalyst use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

RN **7440-06-4 HCAPLUS**
 CN **Platinum (8CI, 9CI) (CA INDEX NAME)**

Pt

IT **690247-89-3D**, ester hydrolysis products
 RL: DEV (Device component use); USES (Uses)
 (electrode structure for polymer electrolyte **fuel cells**)

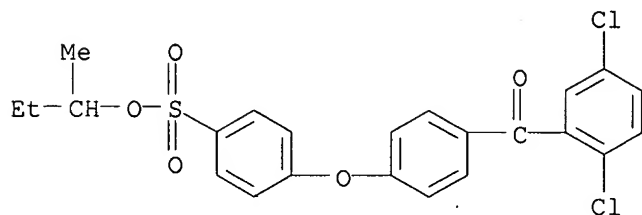
RN **690247-89-3 HCAPLUS**
 CN **Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-**

1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

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CRN 690247-88-2

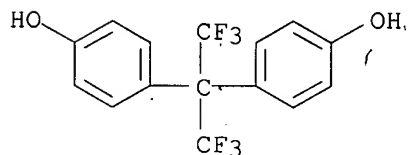
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CM 2

CRN 1478-61-1

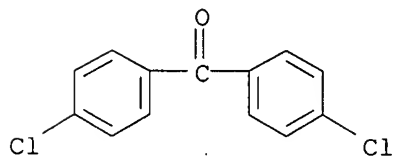
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IT 9002-84-0, Ptfе

RL: MOA (Modifier or additive use); USES (Uses)
(electrode structure for polymer electrolyte fuel cells)

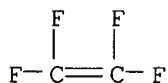
RN 9002-84-0 HCAPLUS

CN Ethene, tetrafluoro-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 116-14-3

CMF C2 F4



IT 122325-09-1P 663920-23-8P, Benzenesulfonic acid,
4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt 663920-24-9P,
4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride
690247-88-2P 690247-89-3P

RL: SPN (Synthetic preparation); PREP (Preparation)
(electrode structure for polymer electrolyte fuel
cells)

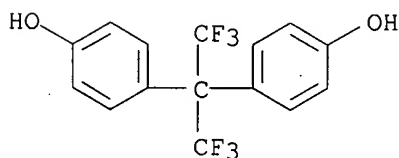
RN 122325-09-1 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 1478-61-1

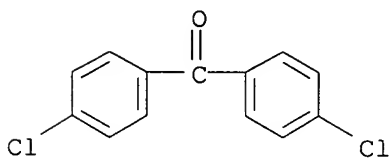
CMF C15 H10 F6 O2



CM 2

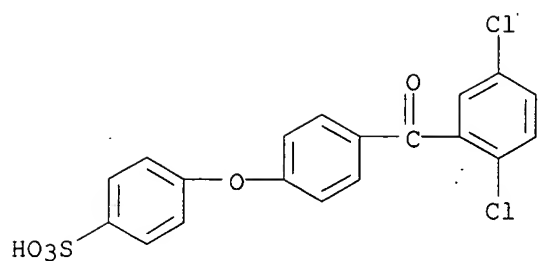
CRN 90-98-2

CMF C13 H8 Cl2 O



RN 663920-23-8 HCAPLUS

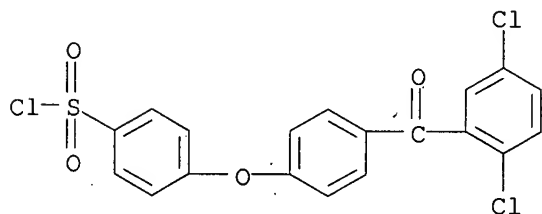
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt
(9CI) (CA INDEX NAME)



● Na

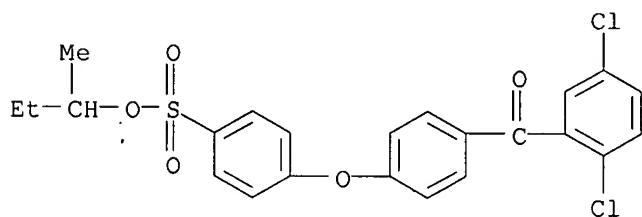
RN 663920-24-9 HCAPLUS

CN Benzenesulfonyl chloride, 4-[4-(2,5-dichlorobenzoyl)phenoxy]- (9CI) (CA INDEX NAME)



RN 690247-88-2 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester (9CI) (CA INDEX NAME)



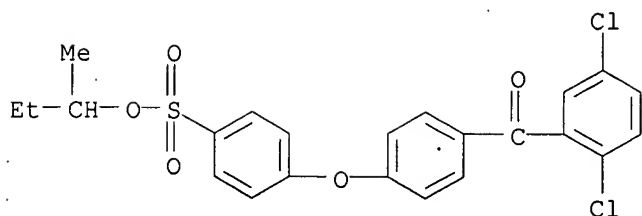
RN 690247-89-3 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethyldiene]bis[phenol], block (9CI) (CA INDEX NAME)

CM 1

CRN 690247-88-2

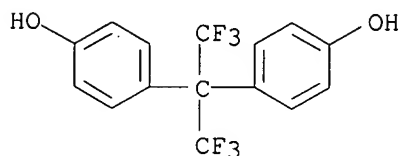
CMF C23 H20 Cl2 O5 S



CM 2

CRN 1478-61-1

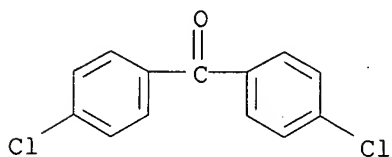
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IT 7440-44-0, Carbon, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support; electrode structure for polymer electrolyte **fuel cells**)
 RN 7440-44-0 HCAPLUS
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L132 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:182578 HCAPLUS

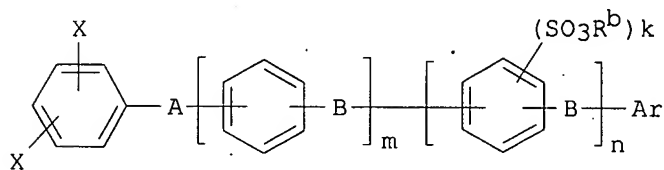
DN 140:218271

TI Novel aromatic sulfonic acid ester derivative, polyarylene, polyarylene
 having sulfonic acid group and process for producing the same, and polymer
 solid electrolyte and proton-conductive **membrane**

IN Rozhanskii, Igor; Takahashi, Masayuki; Goto, Kohei; Konno, Yousuke;

Ohtsuki, Toshihiro; Yamakawa, Yoshitaka; Kadota, Toshiaki
 PA JSR Corporation, Japan
 SO U.S. Pat. Appl. Publ., 61 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI.	US 2004044166	A1	20040304	US 2003-642694	20030819 <--
	JP 2004137444	A	20040513	JP 2002-364229	20021216 <--
	KR 2004018153	A	20040302	KR 2003-57442	20030820 <--
	EP 1400548	A1	20040324	EP 2003-18995	20030821 <--
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	CN 1495159	A	20040512	CN 2003-155160	20030822 <--
	CN 1737032	A	20060222	CN 2005-10097614	20030822 <--
PRAI	JP 2002-242508	A	20020822	<--	
	JP 2002-364229	A	20021216	<--	
	CN 2003-155160	A3	20030822		
OS	MARPAT 140:218271				
GI					



AB Disclosed is an aromatic sulfonic acid ester derivative represented by the formula (I); where X is an atom or a group selected from a halogen atom excluding fluorine, -OSO₃CH₃ and -OSO₃CF₃, A is a divalent electron attractive group, B is a divalent electron donating group or a direct bonding, Ra is a hydrocarbon group of 1 to 20 carbon atoms, Ar is an aromatic group having a substituent of -SO₃R_b (wherein R_b is a hydrocarbon group of 1 to 20 carbon atoms), m is an integer of 0 to 10, n is an integer of 0 to 10 and k is an integer of 1 to 4. Also disclosed is a process for producing a polyarylene having a sulfonic acid group, which process comprises the steps of coupling polymerization of an aromatic compound containing the derivative of the formula (I), to prepare a polyarylene and hydrolysis of the polyarylene, and which process has high safety and is easily capable of controlling the amount of sulfonic acid group introduced into a polymer and the introducing position thereof. Thus, ionic conducting polymers were prepared by hydrolyzed bisphenol AF-4,4'-dichlorobenzophenone-iso-Bu 4-[4-(2,5-dichlorobenzoyl)phenoxy]benzene sulfonate copolymer with concentrated hydrochloric acid.

IC ICM C08G0002-00
 INCL 528086000
 CC 35-5 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 38, 76
 ST polyarylene solid electrolyte proton conductive **membrane**
 IT Films
 (elec. conductive; preparation of polyarylene-containing aromatic sulfonic acid for

polymer solid electrolyte and proton-conductive **membrane**)

IT Electric conductors
(films; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, cardo; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, fluorine-containing; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Fluoropolymers, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Cardo polymers
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketones; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Polyethers, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, cardo; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Polyethers, preparation
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, fluorine-containing; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Ionic conductors
(polymeric; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT Solid electrolytes
(preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT 663920-23-8P, Sodium 4-[4-(2,5-dichlorobenzoyl)phenoxy]benzene sulfonate 663920-24-9P, 4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzene sulfonyl chloride 663920-33-0P 663920-34-1P 663920-35-2P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive **membrane**)

IT 663920-27-2P 663920-28-3P 663920-29-4P 663920-32-9P 663920-37-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(ionic conducting polymer precursor; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

IT 663920-27-2DP, hydrolyzed 663920-28-3DP, hydrolyzed 663920-29-4DP, hydrolyzed 663920-32-9DP, hydrolyzed 663920-37-4DP, hydrolyzed
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(ionic conducting polymer; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

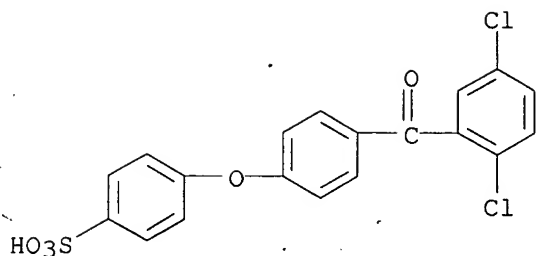
IT 663920-25-0P 663920-26-1P 663920-36-3P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(monomer; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

IT 41206-07-9P, 9,9-Bis(4-hydroxyphenyl)fluorene-4,4'-dichlorobenzophenone copolymer, sru 69266-28-0P 107087-84-3P, 9,9-Bis(4-hydroxyphenyl)fluorene-4,4'-dichlorobenzophenone copolymer 122325-09-1P, Bisphenol AF-4,4'-dichlorobenzophenone copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

IT 75-84-3, 2,2-Dimethyl-1-propanol 78-83-1, 2-Methyl-1-propanol, reactions 831-82-3, p-Phenoxyphenol 2308-54-5, Acetylsulfuric acid 10025-87-3, Phosphoryl trichloride 151173-25-0, 2,5-Dichloro-4'-phenoxybenzophenone 270903-87-2, 2,5-Dichloro-4'-fluorobenzophenone
RL: RCT (Reactant); RACT (Reactant or reagent)
(starting materials; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

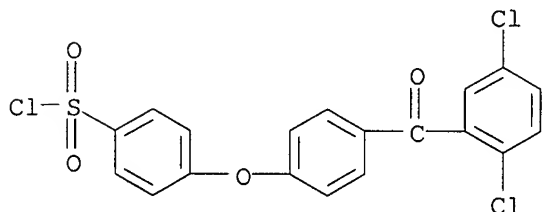
IT 663920-23-8P, Sodium 4-[4-(2,5-dichlorobenzoyl)phenoxy]benzene sulfonate 663920-24-9P, 4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzene sulfonate
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; preparation of polyarylene-containing aromatic sulfonic acid for polymer solid electrolyte and proton-conductive membrane)

RN 663920-23-8 HCAPLUS
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt (9CI) (CA INDEX NAME)



● Na

RN 663920-24-9 HCAPLUS
 CN Benzenesulfonyl chloride, 4-[4-(2,5-dichlorobenzoyl)phenoxy]- (9CI) (CA INDEX NAME)



L132 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:71318 HCAPLUS

DN 140:149110

TI Protonic acid-containing crosslinkable resins, their crosslinked products, and their use in **fuel cells**

IN Ishikawa, Junichi; Nakata, Tomoyuki; Fujiyama, Akiko; Omi, Katsuhiko; Tamai, Masashi

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 78 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004026889	A	20040129	JP 2002-181632	20020621 <--
PRAI	JP 2002-181632		20020621		<--

AB The resins have crosslinkable groups (e.g., carbonyl, Cl-10 alkyl bonded to aromatic ring) and protonic acid groups (e.g., SO₃H) and can be crosslinked by light, heat, or electron beam. Photocrosslinked products of the resins and **fuel cell** ion-conducting polymer **membranes** obtained from the resins or the photocrosslinked products are also claimed. The crosslinked resins have high ion conductivity and

MeOH resistance, so that the **fuel cells** such as DFFC using the **membranes** have high durability.

IC ICM C08G0069-26

ICS C08G0073-10; C08G0073-22; H01B0001-06; H01M0008-02; H01M0008-10

- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 38
- ST crosslinkable resin **fuel cell** ion conductor
membrane; protonic acid photocrosslinked polymer **membrane**
fuel cell; direct methano **fuel cell**
- IT **Fuel cells**
(DMFC; protonic acid-containing crosslinkable resins for ion-conducting
membranes in fuel cells)
- IT Polysulfones, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(blends with sulfo-containing compds.; protonic acid-containing
crosslinkable
resins for ion-conducting **membranes in fuel**
cells)
- IT Crosslinking
(photochem.; protonic acid-containing crosslinkable resins for
ion-conducting **membranes in fuel cells**)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(polyether-, blends with sulfo-containing polymers; protonic acid-containing
crosslinkable resins for ion-conducting **membranes in**
fuel cells)
- IT Polyketones
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(polyether-, sulfonated, sodium salts, crosslinked, ion-exchanged;
protonic acid-containing crosslinkable resins for ion-conducting
membranes in fuel cells)
- IT Polyethers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(polyketone-, blends with sulfo-containing polymers; protonic
acid-containing
crosslinkable resins for ion-conducting **membranes in**
fuel cells)
- IT Polyethers, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(polyketone-, sulfonated, sodium salts, crosslinked, ion-exchanged;
protonic acid-containing crosslinkable resins for ion-conducting
membranes in fuel cells)
- IT **Fuel cell electrolytes**
Ionic conductors
(protonic acid-containing crosslinkable resins for ion-conducting
membranes in fuel cells)
- IT Crosslinking
(radiochem.; protonic acid-containing crosslinkable resins for
ion-conducting **membranes in fuel cells**)
- IT Polyamides, uses
Polyimides, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(sulfo-containing; protonic acid-containing crosslinkable resins for
ion-conducting **membranes in fuel cells**)
- IT Polyoxyphenylenes
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(sulfonated, sodium salts, blends with polyether-polyketones,

- ion-exchanged; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT Polybenzoxazoles
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonated; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT Crosslinking
(thermal; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 25134-01-4DP, Poly(2,6-dimethyl-1,4-phenylene oxide), sulfonated, sodium salt, ion-exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(assumed monomers, blends with polyether-polyketones; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 515144-61-3DP, ion-exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blends with polyamides; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 515144-60-2P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blends with polyether-polyketones or anthraquinone; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 24938-67-8DP, Poly(2,6-dimethyl-1,4-phenylene oxide), sulfonated, sodium salt, ion-exchanged 515144-58-8DP, ion-exchanged 515144-64-6DP, ion-exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blends with polyether-polyketones; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 1323-19-9
RL: TEM (Technical or engineered material use); USES (Uses)
(blends with polyether-polyketones; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 515144-51-1DP, ion-exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blends with polyimides; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 853-68-9D, ion-exchanged
RL: TEM (Technical or engineered material use); USES (Uses)
(blends with polysulfones; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 515144-56-6P 515144-57-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blends with sulfo-containing polyimides; protonic acid-containing crosslinkable resins for ion-conducting **membranes in fuel cells**)
- IT 25897-65-8P, Bisphenol A-4,4'-difluorobenzophenone copolymer 41205-96-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(blends with sulfo-containing polymers; protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

IT 84-65-1, 9,10-Anthracenedione
 RL: TEM (Technical or engineered material use); USES (Uses)
 (blends with sulfo-containing polysulfones; protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

IT 127669-56-1P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blends with sulfonated polyamides; protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

IT 29658-28-4P 87792-34-5P 515144-54-4P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blends with sulfonated polyether-polyketones; protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

IT 240405-82-7
 RL: TEM (Technical or engineered material use); USES (Uses)
 (blends with sulfonated polyether-polyketones; protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

IT 515144-36-2DP, ion-exchanged 515144-37-3DP, ion-exchanged
 515144-38-4DP, ion-exchanged **515144-39-5DP**, ion-exchanged
 515144-41-9DP, ion-exchanged 515144-42-0DP, ion-exchanged
 651326-38-4DP, sulfonated 651326-39-5DP, ion-exchanged 651326-40-8DP, ion-exchanged
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

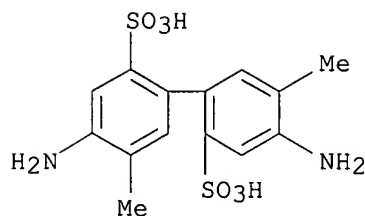
IT **515144-39-5DP**, ion-exchanged
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (protonic acid-containing crosslinkable resins for ion-conducting **membranes** in **fuel cells**)

RN 515144-39-5 HCAPLUS
 CN [1,1'-Biphenyl]-2,2'-disulfonic acid, 4,4'-diamino-5,5'-dimethyl-, disodium salt, polymer with 3,3'-carbonylbis[benzoyl chloride] (9CI) (CA INDEX NAME)

CM 1

CRN 67027-35-4

CMF C14 H16 N2 O6 S2 . 2 Na

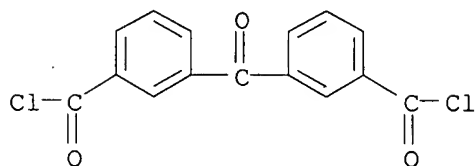


● 2 Na

CM 2

CRN 6472-69-1

CMF C15 H8 C12 O3



L132 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:32648 HCAPLUS

DN 140:114193

TI Manufacture of thermally crosslinkable protonic acid-containing polymers, their crosslinked products, and ion-conductive **membranes** for **fuel cells**

IN Ishikawa, Junichi; Nakata, Tomoyuki; Fujiyama, Akiko; Omi, Katsuhiko; Tamai, Masashi

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 60 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004010677	A	20040115	JP 2002-163327	20020604 <--
PRAI	JP 2002-163327		20020604		<--
AB	The membranes comprise polymers having protonic acid groups in the chains and thermally crosslinkable groups in the chains or at the terminates (e.g., sulfonated polyetherketones, sulfonated polyimides, sulfonated polyamides, sulfonated polybenzoxazoles), and show ion-exchange equivalent weight ≤ 1000 g/mol and solubility in MeOH $< 15\%$. The membranes show high ionic conductivity, good MeOH resistance, and low MeOH permeability.				
IC	ICM C08G0085-00				
	ICS B01D0053-22; B01D0071-52; B01D0071-64; B01D0071-68; C08J0005-22; H01M0008-02; H01M0008-10; C08L0101-02				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				

Section cross-reference(s): 38, 76

- ST **fuel cell** electrolyte polymer **membrane** ion conductor; polyetherketone sulfonated polyimide polyamide polybenzoxazole electrolyte **fuel cell**
- IT **Membranes**, nonbiological
(ion-conductive; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT **Fuel cell electrolytes**
Fuel cells
Polymer electrolytes
(manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyamide-, sulfo-containing, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyamide-polyimide-, sulfo-containing, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polyimides, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyamide-polyketone-, sulfo-containing, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polybenzoxazole-, sulfonated, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)
- IT Polysulfones, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyimide-, sulfo-containing, crosslinked; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)

- IT Polyamides, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyimide-polyketone-, sulfo-containing, crosslinked; manufacture of
 thermally crosslinkable protonic acid-containing polymers for ion-conductive
membranes useful for **fuel cell**
 electrolytes)
- IT Polyamides, uses
 Polyethers, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, sulfo-containing, crosslinked; manufacture of thermally
 crosslinkable protonic acid-containing polymers for ion-conductive
membranes useful for **fuel cell**
 electrolytes)
- IT Polybenzoxazoles
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, sulfonated, crosslinked; manufacture of thermally
 crosslinkable protonic acid-containing polymers for ion-conductive
membranes useful for **fuel cell**
 electrolytes)
- IT Ionic conductors
 (polymeric; manufacture of thermally crosslinkable protonic acid-containing
 polymers for ion-conductive **membranes** useful for **fuel**
cell electrolytes)
- IT Polyimides, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, sulfo-containing, crosslinked; manufacture of thermally
 crosslinkable protonic acid-containing polymers for ion-conductive
membranes useful for **fuel cell**
 electrolytes)
- IT Polyoxyphenylenes
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfonated, crosslinked; manufacture of thermally crosslinkable protonic
 acid-containing polymers for ion-conductive **membranes** useful for
fuel cell electrolytes)
- IT 102501-86-ODP, 2-Allyl phenol-2,6-dimethylphenol copolymer, sulfonated
 210531-46-7DP, Bisphenol A-4,4'-difluorobenzophenone-disodium
 5,5'-carbonylbis(2-fluorobenzenesulfonate) copolymer, crosslinkable
 compound-terminated, desalted 515144-71-5DP, maleic anhydride-terminated,
 desalted 515144-72-6DP, maleic anhydride-terminated, desalted
 646052-78-ODP, 3-ethynylbenzoyl chloride-terminated, desalted
 646052-82-6DP, sulfonated
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; manufacture of thermally crosslinkable protonic
 acid-containing
 polymers for ion-conductive **membranes** useful for **fuel**
cell electrolytes)
- IT 646052-81-5DP, sulfonated
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
 (Reactant or reagent)
 (crosslinked; manufacture of thermally crosslinkable protonic
 acid-containing
 polymers for ion-conductive **membranes** useful for **fuel**
cell electrolytes)

IT 108-31-6DP, Maleic anhydride, reaction product with polyimides, crosslinked, desalted 766-98-3DP, reaction products with bisphenol A-difluorobenzophenone-disodium carbonylbis(fluorobenzenesulfonate) copolymer, crosslinked, desalted 821-10-3DP, 1,4-Dichlorobutylene, reaction products with bisphenol A-difluorobenzophenone-disodium carbonylbis(fluorobenzenesulfonate) copolymer, crosslinked, desalted 1076-99-9DP, 4-Allylbenzoic acid, reaction product with benzophenonedicarboxylic acid-diaminodihydroxybiphenyl dihydrochloride copolymer, sulfonated crosslinked 5216-31-9DP, Bis(4-fluorophenyl)acetylene, reaction products with bisphenol A-difluorobenzophenone-disodium carbonylbis(fluorobenzenesulfonate) copolymer, crosslinked, desalted 10401-11-3DP, 3-Ethynylphenol, reaction products with bisphenol A-difluorobenzophenone-disodium carbonylbis(fluorobenzenesulfonate) copolymer, crosslinked, desalted 143587-37-5DP, reaction product with benzophenonedicarboxylic acid dichloride-diaminodiphenyldisulfonic acid disodium salt copolymer, crosslinked, desalted 646052-77-9DP, reaction product with disodium diaminodiphenyl disulfonate-diaminodiphenylsulfone-naphthalenetetracarboxylic dianhydride copolymer, crosslinked, desalted **646052-80-4DP**, desalted
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (manufacture of thermally crosslinkable protonic acid-containing polymers
 for ion-conductive **membranes** useful for **fuel cell** electrolytes)

IT 102501-86-0P, 2-Allyl phenol-2,6-dimethylphenol copolymer **646052-79-1P**
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (manufacture of thermally crosslinkable protonic acid-containing polymers
 for ion-conductive **membranes** useful for **fuel cell** electrolytes)

IT 7790-94-5, Chlorosulfonic acid
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonating agent; manufacture of thermally crosslinkable protonic acid-containing polymers for ion-conductive **membranes** useful for **fuel cell** electrolytes)

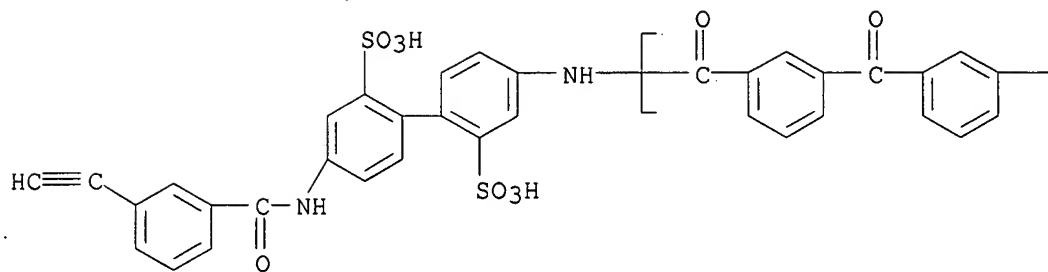
IT **646052-80-4DP**, desalted
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (manufacture of thermally crosslinkable protonic acid-containing polymers
 for ion-conductive **membranes** useful for **fuel cell** electrolytes)

RN 646052-80-4 HCAPLUS
 CN Poly[imino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-phenylenecarbonyl-1,3-phenylenecarbonyl], α -(3-ethynylbenzoyl)- ω -[[4'-[(3-ethynylbenzoyl)amino]-2,2'-disulfo[1,1'-biphenyl]-4-yl]amino]-, sodium salt, homopolymer (9CI) (CA INDEX NAME)

CM 1

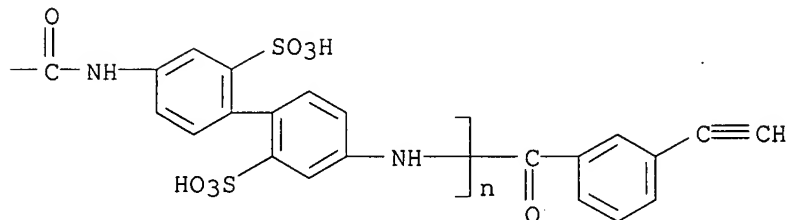
CRN 646052-79-1
 CMF (C27 H18 N2 O9 S2)n C30 H20 N2 O8 S2 . x Na
 CCI PMS

PAGE 1-A



● x Na

PAGE 1-B



IT 646052-79-1P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

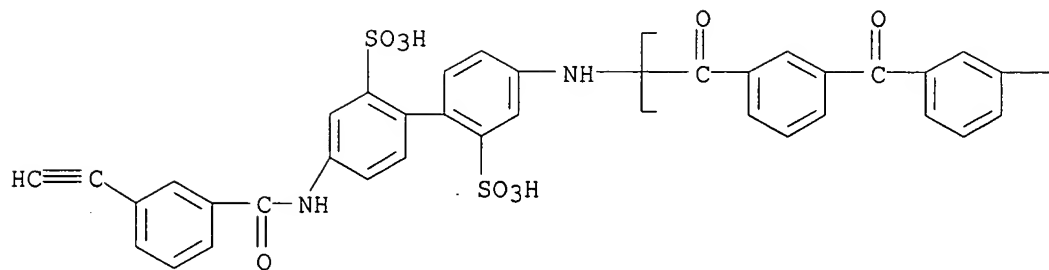
(manufacture of thermally crosslinkable protonic acid-containing polymers for

ion-conductive **membranes** useful for **fuel cell** electrolytes)

RN 646052-79-1 HCAPLUS

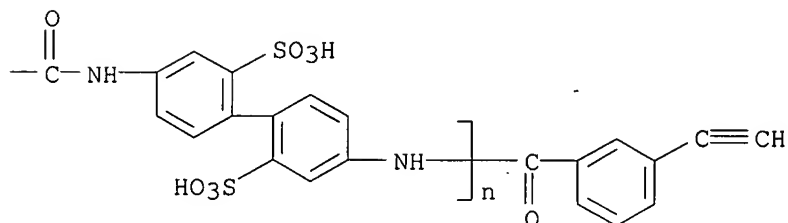
CN Poly[imino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-phenylenecarbonyl-1,3-phenylenecarbonyl], α -(3-ethynylbenzoyl)- ω -[[4'-[(3-ethynylbenzoyl)amino]-2,2'-disulfo[1,1'-biphenyl]-4-yl]amino]-, sodium salt (9CI) (CA INDEX NAME)

PAGE 1-A



● x Na

PAGE 1-B



L132 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN
 AN 2003:913207 HCAPLUS
 DN 139:396487
 TI Sulfonated copolymer for polymer electrolyte **membrane**
 IN Cao, Shuguang; Xu, Helen; Chen, Jingping
 PA Polyfuel, Inc., USA
 SO PCT Int. Appl., 32 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 FAN.CNT 6

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 2003095509	A1	20031120	WO 2003-US15178	20030513 <--	
	W:			AE, AG, AL, AM, AT , AU , AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW		
	RW:			GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG		
	AU 2003237849	A1	20031111	AU 2003-237849	20030513 <--	
	CA 2485727	A1	20031120	CA 2003-2485727	20030513 <--	
	EP 1517929	A1	20050330	EP 2003-736609	20030513 <--	

jan delaval - 16 january 2007

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

CN 1668656	A	20050914	CN 2003-816349	20030513 <--
JP 2006506472	T	20060223	JP 2004-503520	20030513 <--
US 2006135657	A1	20060622	US 2006-350228	20060207 <--
PRAI US 2002-381136P	P	20020514	<--	
US 2002-426540P	P	20021115	<--	
US 2003-446395P	P	20030210		
US 2003-449299P	P	20030220		
US 2003-438299	A3	20030513		
WO 2003-US15178	W	20030513		

109490

AB This invention relates to sulfonated copolymers for proton-conducting **membranes** allowing the dimensional stability of polymer electrolyte **membrane** over a wide temperature range and avoiding excessive **membrane** swelling in direct methanol **fuel cells**. The method for the preparation of a sulfonated polymers is included the steps of combining a first monomer having at least one sulfonate group and having at least two leaving groups with a second comonomer having at least two groups that can displace at least one leaving group of the first monomer and a third comonomer having at least two leaving groups, and a fourth comonomer having at least two displacing groups that can react with the leaving groups of either said first comonomer or said third comonomer and is used for proton exchange **membranes**, catalyst coated **membranes** and **membrane** electrode assembly preparation. Exemplified polymer is prepared by heating of the mixture of 9.13 g of bisphenol A, 5.67 g of 4,4'-difluorobenzophenone, 5.91 g of 4,4'-difluoro-3,3'-disulfonyl-benzophenone and 7.2 g of potassium carbonate in a mixture of DMSO and toluene at 150° for 4 h and keeping at at 180° for 6 h with further precipitation with acetone or methanol. The dry polymer is dissolved

in

DMAC for 20% coating solution and the obtained 2 mil thick **membrane** is soaked in sulfuric acid for 16 h.

IC ICM C08F0016-36

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 52

ST sulfonated copolymer direct methanol **fuel cell**; proton exchange **membranes** catalyst coated **membrane membrane** electrode assembly

IT Polyketones

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, aromatic, cardo, sulfo-containing; sulfonated copolymer for polymer electrolyte **membrane**)

IT Polyketones

RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, aromatic, fluorine-containing, sulfo-containing; sulfonated copolymer for polymer electrolyte **membrane**)

IT Polyketones

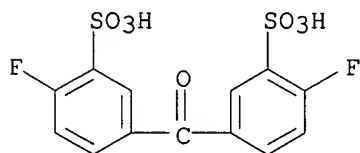
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, aromatic, sulfonated; sulfonated copolymer for polymer electrolyte **membrane**)

IT Polyketones

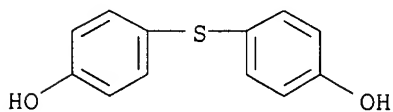
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (polyether-, ionomers, sulfo-containing; sulfonated copolymer for polymer electrolyte **membrane**)

- IT Fluoropolymers, preparation
Polythioethers
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, aromatic, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Polysulfones, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, cardo, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Cardo polymers
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-polysulfones, sulfo-containing; sulfonated copolymer
for polymer electrolyte **membrane**)
- IT Cardo polymers
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketones, aromatic, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polysulfone-, cardo, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polythioether-, aromatic, sulfo-containing; sulfonated copolymer
for polymer electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, aromatic, cardo, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, aromatic, fluorine-containing, sulfo-containing; sulfonated
copolymer for polymer electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, aromatic, sulfonated; sulfonated copolymer for polymer
electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, ionomers, sulfo-containing; sulfonated copolymer for polymer
electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-polysulfone-, cardo, sulfo-containing; sulfonated copolymer for
polymer electrolyte **membrane**)
- IT Polyethers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); TEM
(Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-polythioether-, aromatic, sulfo-containing; sulfonated copolymer

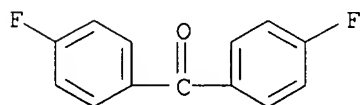
for polymer electrolyte membrane)
 IT Fuel cell electrolytes
 Membranes, nonbiological
 (sulfonated copolymer for polymer electrolyte membrane)
 IT 625392-07-6P 625392-08-7P 625392-10-1P 625392-12-3P
 625392-14-5P 625392-16-7P 625392-17-8P 625392-19-0P 625392-21-4P
 625392-23-6P 625392-25-8P 625392-26-9P 625392-28-1P
 625392-30-5P 625392-32-7P 625392-35-0P 625392-38-3P
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfonated copolymer for polymer electrolyte membrane)
 IT 625392-10-1P 625392-12-3P 625392-30-5P
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM
 (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (sulfonated copolymer for polymer electrolyte membrane)
 RN 625392-10-1 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, polymer with
 bis(4-fluorophenyl)methanone and 4,4'-thiobis[phenol] (9CI) (CA INDEX
 NAME)
 CM 1
 CRN 625392-06-5
 CMF C13 H8 F2 O7 S2



CM 2
 CRN 2664-63-3
 CMF C12 H10 O2 S



CM 3
 CRN 345-92-6
 CMF C13 H8 F2 O

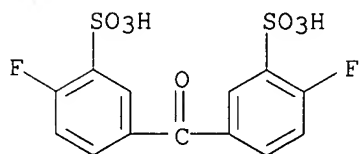


RN 625392-12-3 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, polymer with
 bis(4-fluorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-
 (trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 625392-06-5

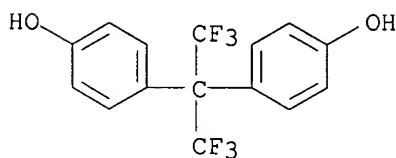
CMF C13 H8 F2 O7 S2



CM 2

CRN 1478-61-1

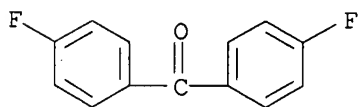
CMF C15 H10 F6 O2



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



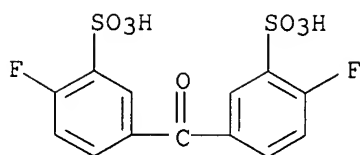
RN 625392-30-5 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, polymer with
 bis(4-fluorophenyl)methanone, 4,4'-oxybis[phenol] and 4,4'-[2,2,2-
 trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 625392-06-5

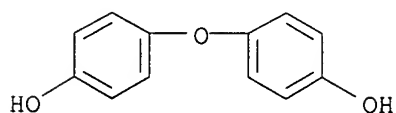
CMF C13 H8 F2 O7 S2



CM 2

CRN 1965-09-9

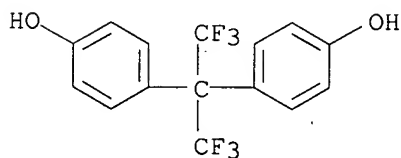
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CM 3

CRN 1478-61-1

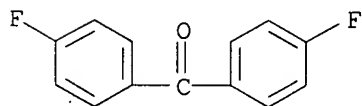
CMF C15 H10 F6 O2



CM 4

CRN 345-92-6

CMF C13 H8 F2 O



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Gan	2001	50	812	Polymer International	HCAPLUS
Liu	2001	222	579	Macromol Rapid Commun	
Liu	2001	42	3293	Polymer	HCAPLUS
McGrath	2002			US 20020091225 A1	
Wang	1998	199	1421	Macromol Chem Phys	HCAPLUS
Xiao	2002	48	309	Polymer Bulletin	HCAPLUS

L132 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2003:805815 HCAPLUS

DN 139:310058

TI Crosslinking polysulfones containing protonic acid groups, their manufacture, ion conductive polymer **membranes**, and **fuel cells** with such **membranes**

IN Ishikawa, Junichi; Nakata, Tomoyuki; Fujiyama, Akiko; Omi, Takehiko; Tamai, Masashi

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 23 pp.

CODEN: JKXXAF

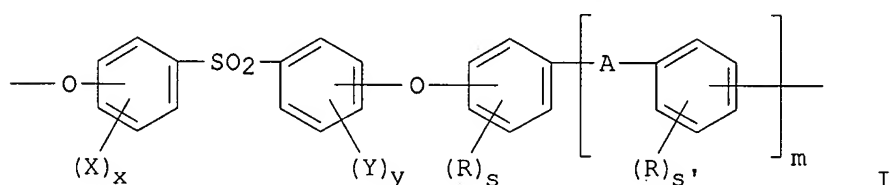
DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003292609	A	20031015	JP 2002-104461	20020405 <--
PRAI	JP 2002-104461		20020405	<--	

GI



AB Polysulfones having protonic acid groups in their chains and heat- and/or photocrosslinking groups in their chains and/or at terminals; their crosslinked products; their use as ion conducting polymer **membranes** in **fuel cells**; and such **fuel cells** are claimed. The said polymers preferably comprise structural repeating unit I (A = single bond, CH₂, CMe₂, O, S, SO₂, CO; m = 0, 1, 2; R, R₁ = C1-10 alkyl; s, s' = integer of 0-4; X, Y = groups of sulfonic acid, carboxylic acid, phosphoric acid, their metal salt; x, y = integer of 0-2; x + y ≥ 1). Method for preparation of such polymers by condensation polymerization of di-Ph sulfones and aromatic diols, given in

Markush

structures, are also claimed. The **membranes** have excellent resistance to MeOH and water and give **fuel cells** with long service life.

IC ICM C08G0065-40

ICS C08G0065-48; C08J0005-22; H01B0001-06; H01B0013-00; H01M0008-02; H01M0008-10; C08L0071-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

ST polysulfone protonic acid contg ionic conductor; **fuel cell** ionic conductor **membrane**; crosslinking polysulfone ionic conductor

IT **Fuel cells**

(manufacture of crosslinked polysulfone-polyether ionomers for **membranes** in **fuel cells**)

IT Ionomers

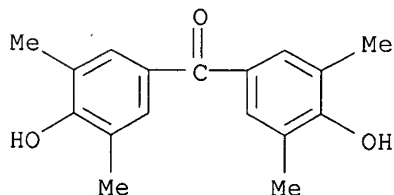
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

- (manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT Polysulfones, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-, aromatic, crosslinked; manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT Ionic conductors
 (polymeric, **membranes**; manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT Polyethers, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polysulfone-, aromatic, crosslinked; manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT 515144-34-0P 610322-39-9P 610322-40-2P 610322-41-3P 610322-42-4P
 610322-43-5P 610322-45-7P 610322-46-8P 610322-47-9P 610322-48-0P
 610322-49-1P 610322-50-4P 610322-51-5P **610322-52-6P**
 610322-53-7P
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT 57570-28-2P
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT 80-07-9, 4,4'-Dichlorodiphenylsulfone 8014-95-7, Fuming sulfuric acid
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- IT **610322-52-6P**
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (crosslinked; manufacture of crosslinked polysulfone-polyether ionomers for **membranes in fuel cells**)
- RN 610322-52-6 HCAPLUS
 CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with bis(4-hydroxy-3,5-dimethylphenyl)methanone (9CI) (CA INDEX NAME)

CM 1

CRN 92005-15-7

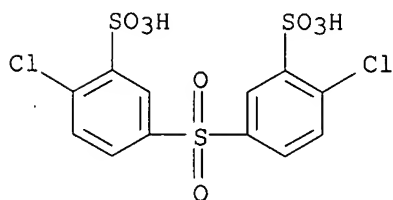
CMF C17 H18 O3



CM 2

CRN 51698-33-0

CMF C12 H8 C12 O8 S3 . 2 Na



● 2 Na

L132 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2003:568621 HCAPLUS

DN 139:118408

TI Halogenated aromatic compound, (co)polymer thereof, and proton-conductive membrane comprising same

IN Yamakawa, Yoshitaka; Takahashi, Masayuki; Goto, Kohei

PA JSR Corporation, Japan

SO Eur. Pat. Appl., 33 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1329444	A1	20030723	EP 2003-1191	20030121 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	JP 2003286339	A	20031010	JP 2003-9485	20030117 <--
	US 2003173547	A1	20030918	US 2003-347336	20030121 <--
	US 6833426	B2	20041221		
PRAI	JP 2002-13450	A	20020122	<--	

AB A halogenated aromatic compound, a polyarylene (co)polymer obtained by the polymerization of such a halogenated aromatic compound as a monomer component, and a

proton-conductive **membrane** made of a sulfonation product of such a (co)polymer are disclosed. The halogenated aromatic compound is represented by the following general formula $R1X1A(X2BX3A)aX4B(X5B)bZ$ (A = electron-withdrawing group; B = electron-donating atom or divalent group; X = halogenated phenylene groups; Z = aryl group; a; b = 1-20). Thus, adding 2,5-dichloro-4'-[4-(4-(4-phenoxy)phenoxy]benzoyl]phenoxybenzophenone 12.3, [4,4'-dichlorobenzophenone 2,2-bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane] (Mn 12,200) 6.83, bis(triphenylphosphine)nickel dichloride 0.589, NaI 0.507, triphenylphosphine 2.73 and Zn 4.08 g to a flask, after purging with N, combining with 54.6 mL N-methylpyrrolidone and heating with stirring at 80° for 3 h gave a polymer which was precipitated and sulfonated to give a conductive polymer. The polymer was soluble

in N-methylpyrrolidone and THF and insol. in acetone, methanol, and water. A solvent-cast film made from the sulfonated polymer had good strength and resistance to hot water and Fenton's reagent.

IC ICM C07C0049-84
ICS C07C0317-22; C08G0065-40; C08G0061-12; C08G0075-23; C08J0005-22

CC 38-3 (Plastics Fabrication and Uses)

ST halogenated polyphenyl sulfonation proton conductive **membrane**
manuf; chem hot water resistance **membrane** sulfonated polyphenyl
polymer

IT **Membranes**, nonbiological
(manufacture of halogenated aromatic compds. for polymers useful for
proton-conductive **membrane** production)

IT Polyketones
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polyether-, fluorine-containing; manufacture of halogenated aromatic
compds. for
polymers useful for proton-conductive **membrane** production)

IT Fluoropolymers, uses
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-; manufacture of halogenated aromatic compds. for
polymers useful for proton-conductive **membrane** production)

IT Polyoxyphenylenes
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, fluorinated; manufacture of halogenated aromatic compds. for
polymers useful for proton-conductive **membrane** production)

IT Polyethers, uses
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, fluorine-containing; manufacture of halogenated aromatic
compds. for
polymers useful for proton-conductive **membrane** production)

IT Polyketones
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polyoxyphenylene-, fluorinated; manufacture of halogenated aromatic compds.
for polymers useful for proton-conductive **membrane** production)

IT **565228-58-2DP**, sulfonated products
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(manufacture of halogenated aromatic compds. for polymers useful for
proton-conductive **membrane** production)

IT **69266-28-0P 122325-09-1P**, Bisphenol AF-4,4'-
dichlorobenzophenone copolymer **151173-25-0P**,
2,5-Dichloro-4'-phenoxybenzophenone **565228-52-6P**
565228-55-9P 565228-58-2P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(manufacture of halogenated aromatic compds. for polymers useful for
proton-conductive **membrane** production)

IT 101-84-8, Diphenyl ether **403-43-0**, 4-Fluorobenzoic acid chloride
831-82-3, 4-Phenoxyphenol **2905-61-5**, 2,5-Dichlorobenzoyl
chloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of halogenated aromatic compds. for polymers useful for
proton-conductive **membrane** production)

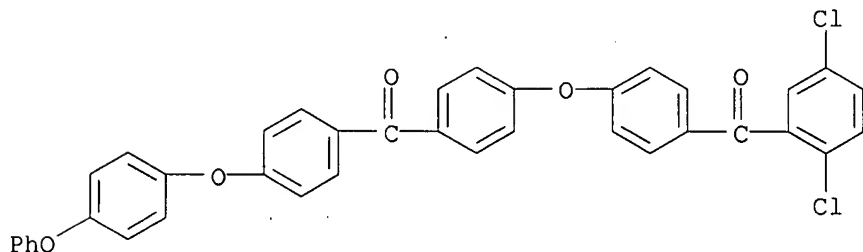
IT **565228-58-2DP**, sulfonated products
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(manufacture of halogenated aromatic compds. for polymers useful for
proton-conductive **membrane** production)

RN 565228-58-2 HCAPLUS
 CN Methanone, bis(4-chlorophenyl)-, polymer with [4-[4-(2,5-dichlorobenzoyl)phenoxy]phenyl][4-(4-phenoxyphenoxy)phenyl]methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 565228-55-9

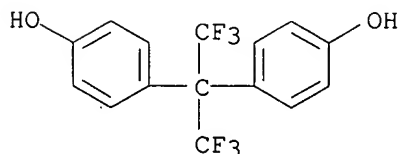
CMF C38 H24 Cl2 O5



CM 2

CRN 1478-61-1

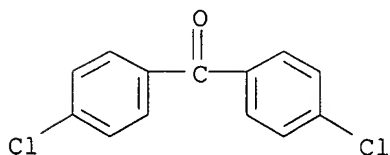
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



IT **69266-28-0P 122325-09-1P**, Bisphenol AF-4,4'-dichlorobenzophenone copolymer **151173-25-0P**, 2,5-Dichloro-4'-phenoxybenzophenone **565228-52-6P** **565228-55-9P 565228-58-2P**

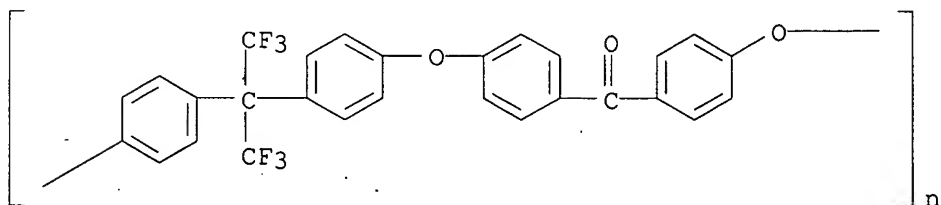
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(manufacture of halogenated aromatic compds. for polymers useful for

proton-conductive **membrane** production)

RN 69266-28-0 HCAPLUS

CN Poly[oxy-1,4-phenylenecarbonyl-1,4-phenyleneoxy-1,4-phenylene[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]-1,4-phenylene] (9CI) (CA INDEX NAME)



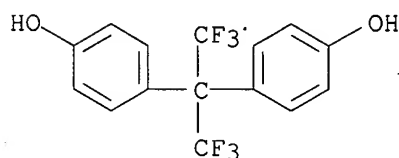
RN 122325-09-1 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 1478-61-1

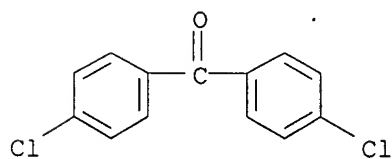
CMF C15 H10 F6 O2



CM 2

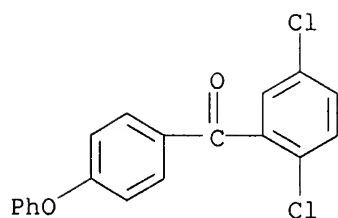
CRN 90-98-2

CMF C13 H8 Cl2 O

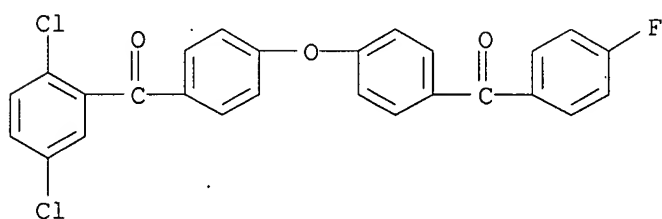


RN 151173-25-0 HCAPLUS

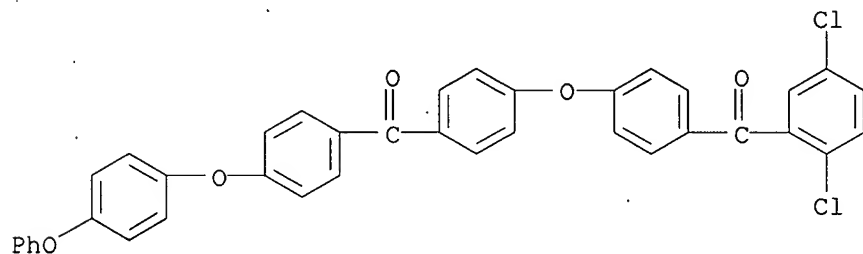
CN Methanone, (2,5-dichlorophenyl)(4-phenoxyphenyl)- (9CI) (CA INDEX NAME)



RN 565228-52-6 HCAPLUS
 CN Methanone, [4-[4-(2,5-dichlorobenzoyl)phenoxy]phenyl](4-fluorophenyl)-
 (9CI) (CA INDEX NAME)



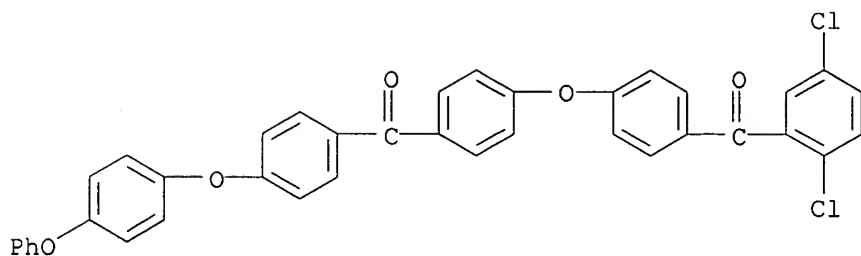
RN 565228-55-9 HCAPLUS
 CN Methanone, [4-[4-(2,5-dichlorobenzoyl)phenoxy]phenyl][4-(4-phenoxyphenoxy)phenyl]- (9CI) (CA INDEX NAME)



RN 565228-58-2 HCAPLUS
 CN Methanone, bis(4-chlorophenyl)-, polymer with [4-[4-(2,5-dichlorobenzoyl)phenoxy]phenyl][4-(4-phenoxyphenoxy)phenyl]methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethyldiene]bis[phenol] (9CI) (CA INDEX NAME)

CM 1

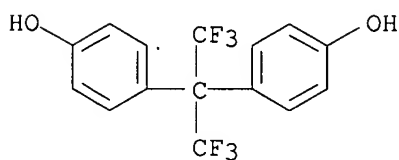
CRN 565228-55-9
 CMF C38 H24 Cl2 O5



CM 2

CRN 1478-61-1

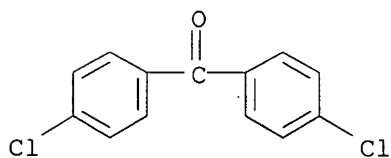
CMF C15 H10 F6 O2



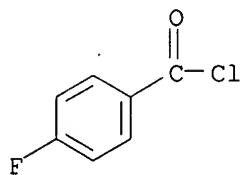
CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O

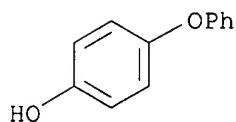


IT 403-43-0, 4-Fluorobenzoic acid chloride 831-82-3,
 4-Phenoxyphenol 2905-61-5, 2,5-Dichlorobenzoyl chloride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of halogenated aromatic compds. for polymers useful for
 proton-conductive **membrane** production)
 RN 403-43-0 HCAPLUS
 CN Benzoyl chloride, 4-fluoro- (9CI) (CA INDEX NAME)



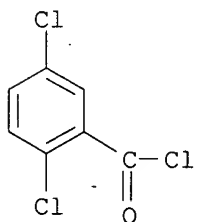
RN 831-82-3 HCAPLUS

CN Phenol, 4-phenoxy- (9CI) (CA INDEX NAME)



RN 2905-61-5 HCAPLUS

CN Benzoyl chloride, 2,5-dichloro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Axiva Gmbh	2000			WO 0051716 A	
Bikson, B	1991			US 5071448 A	HCAPLUS
Jsr Corp	2001			EP 1138712 A	HCAPLUS
Jsr Corp	2002			EP 1245554 A	HCAPLUS
Jsr Corp	2002			EP 1245555 A	HCAPLUS

L132 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2003:319959 HCAPLUS

DN 138:339060

TI Crosslinkable aromatic resins having protonic acid groups, and ion
conductive polymer **membranes**, binders, and **fuel**
cells made by using the same

IN Ishikawa, Junichi; Kuroki, Takashi; Fujiyama, Satoko; Omi, Takehiko;
Nakata, Tomoyuki; Okawa, Yuichi; Miyazaki, Kazuhisa; Fujii, Shigeharu;
Tamai, Shoji

PA Mitsui Chemicals, Inc., Japan

SO PCT Int. Appl., 132 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003033566	A1	20030424	WO 2002-JP10536	20021010 <--
	W: CA, CN, IN, JP, KR, US				
	RW: DE, FR, GB, IT, SE				
	TW 236486	B	20050721	TW 2002-91123279	20021009 <--
	CA 2463429	A1	20030424	CA 2002-2463429	20021010 <--
	EP 1457511	A1	20040915	EP 2002-775319	20021010 <--
	R: DE, FR, GB, IT, SE, SI, LT, LV, RO, MK, AL				
	CN 1630676	A	20050622	CN 2002-820224	20021010 <--
	US 2004191602	A1	20040930	US 2004-820842	20040409 <--
PRAI	JP 2001-312799	A	20011010	<--	

JP 2002-182252 A 20020621 <--

WO 2002-JP10536 W 20021010 <--

- AB The invention relates to (A) a crosslinkable aromatic resin which has crosslinking groups and protonic acid groups and is suitable for electrolyte **membranes** and binders for **fuel cells**, (B) polymeric electrolyte **membranes** and binders for **fuel cells**, made by using the resin, and (C) **fuel cells** made by using the **membranes** or the binders. The aromatic resin has crosslinking groups which are not derived from protonic acid groups and are capable of causing crosslinking without the formation of a leaving component, and exhibits excellent ionic conductivity, heat resistance, water resistance, and adhesion, and low methanol permeability. It is preferable that the aromatic resin bears as the crosslinking groups both Cl-10 alkyl bonded directly to an aromatic ring and carbonyl or carbon-carbon double or triple bonds, while preferred examples of the crosslinkable aromatic resin include aromatic polyether, aromatic polyamide, aromatic polyimide, aromatic polyamide-imide, and aromatic polyazole, each of which has crosslinking groups described above. Thus, 5,5'-carbonylbis(sodium 2-fluorobenzenesulfonate) obtained from 0.525 mol 4,4'-difluorobenzophenone and 210 mL 50% sulfuric acid 4.22, 4,4'-difluorobenzophenone 2.18, and 2,2-bis(3,5-dimethyl-4-hydroxyphenyl)propane 5.69 g were reacted at 160° for 4 h in the presence of potassium carbonate to give 10.39 g polyether ketone powder with reduced viscosity 0.85 dL/g, glass transition temperature 230°, and 5% weight loss temperature 367°, which was applied on a glass and dried at 200° for 4 h to give a **membrane** with conductivity 0.018 S/cm at 30° and 0.065 S/cm at 90°.
- IC ICM C08G0065-40
ICS C08G0069-48; C08G0073-10; C08J0005-22; H01M0008-02
- CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 52
- ST crosslinkable arom resin protonic acid group ion conductive **membrane**; carbonylbissodiumfluorobenzenesulfonate difluorobenzophenone bisdimethylhydroxyphenylpropane copolymer **membrane** prepn
- IT Polyamides, uses
Polyimides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aromatic, protonic acid-containing; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, preparation
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(blend with protonic acid group-containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Binders
(ion conductive; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT **Membranes**, nonbiological
(ionic conductive; preparation of crosslinkable aromatic resins having protonic

- acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (polyamide-, aromatic, protonic acid-containing; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyamide-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyketones
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyamide-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyketones
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyamide-polyimide-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyamide-polyketone-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyethers, preparation
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polybenzoxazole-, blend with protonic acid group-containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyketones
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polybenzoxazole-, sodium sulfonated, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polybenzoxazoles
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyether-, blend with protonic acid group-containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polysulfones, preparation
 Polysulfones, preparation

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, crosslinked; preparation of crosslinkable aromatic resins

having

protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyketones

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, optionally crosslinked, and blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins

having

protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polysulfides

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-, polyketones-; preparation of crosslinkable aromatic resins

having

protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polysulfones, preparation

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-; preparation of crosslinkable aromatic resins having protonic

acid

groups for ion conductive polymer **membranes**, binders, and
fuel cells)

IT Polysulfones, preparation

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-polyketone-; preparation of crosslinkable aromatic resins having
protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyketones

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyether-polysulfone-; preparation of crosslinkable aromatic resins having
protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyamides, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(polyimide-, aromatic, protonic acid-containing; preparation of
crosslinkable aromatic

resins having protonic acid groups for ion conductive polymer

membranes, binders, and **fuel cells**)

IT Polyamides, preparation

Polyketones

Polysulfones, preparation

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyimide-, crosslinked; preparation of crosslinkable aromatic resins

having

protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polysulfones, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

- (polyimide-polyketone-, blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyamides, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyimide-polyketone-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyketones
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyimide-polysulfone-, blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyethers, preparation
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, optionally crosslinked, and blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polybenzoxazoles
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-, sodium sulfonated, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyamides, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyimides, preparation
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfone-, blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT Polyethers, preparation
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (polyketone-polysulfone-; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)

protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyethers, preparation
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polysulfide-, polyketones-; preparation of crosslinkable aromatic resins
having protonic acid groups for ion conductive polymer
membranes, binders, and **fuel cells**)

IT Polyethers, preparation
Polyethers, preparation
Polyimides, preparation
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-, crosslinked; preparation of crosslinkable aromatic resins
having
protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyethers, preparation
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-; preparation of crosslinkable aromatic resins having protonic
acid groups for ion conductive polymer **membranes**, binders,
and **fuel cells**)

IT **Fuel cells**
Ionic conductors
Polymer electrolytes
(preparation of crosslinkable aromatic resins having protonic acid groups
for
ion conductive polymer **membranes**, binders, and **fuel
cells**)

IT Polymer blends
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(preparation of crosslinkable aromatic resins having protonic acid groups
for
ion conductive polymer **membranes**, binders, and **fuel
cells**)

IT Electrodes
(preparation of crosslinkable aromatic resins having protonic acid groups
for
ion conductive polymer **membranes**, binders, electrodes, and
fuel cells)

IT Polyoxyarylenes
RL: TEM (Technical or engineered material use); USES (Uses)
(protonic acid-containing; preparation of crosslinkable aromatic resins
having
protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polyoxyphenylenes
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(sodium sulfonated; preparation of crosslinkable aromatic resins having
protonic acid groups for ion conductive polymer **membranes**,
binders, and **fuel cells**)

IT Polybenzoxazoles
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
engineered material use); PREP (Preparation); USES (Uses)
(sulfonated; preparation of crosslinkable aromatic resins having protonic
acid
groups for ion conductive polymer **membranes**, binders, and

- fuel cells)**
- IT 25134-01-4DP, Poly(2,6-dimethyl-1,4-phenylene oxide), sodium sulfonated
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (assumed monomers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 31694-16-3DP, PEEK 450P, sodium sulfonated
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blend with polyether-polyketone or polybenzoxazole, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 515144-49-7P 515144-50-0P 515144-51-1P **515144-53-3P**
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blend with polyimide; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 29658-28-4P 32034-67-6P
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (blend with protonic acid group containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 87781-17-7P 87792-34-5P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blend with protonic acid group containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 25897-65-8P, Bisphenol A-4,4'-difluorobenzophenone copolymer
 28825-50-5P, 3,3',4,4'-Benzophenonetetracarboxylic dianhydride-3,3'-Diaminodiphenylsulfone copolymer 41205-96-3P 54571-77-6P
 127583-87-3P 127669-56-1P 515144-54-4P 515144-55-5P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blend with protonic acid group-containing polymer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 515144-56-6P 515144-57-7P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (blend with protonic acid group-containing polymers; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)
- IT 108-31-6DP, Maleic anhydride, reaction products with protonic acid group-containing polymers 405-99-2DP, 4-Fluorostyrene, reaction products with sulfonated polymers 620-18-8DP, 3-Vinylphenol, reaction products with sulfonated polymers 1076-99-9DP, 4-Allylbenzoic acid, reaction

products with protonic acid group-containing polymers 1120-71-4DP, Propanesultone, reaction products with aromatic polyether-polyketones 1745-89-7DP, reaction products with sulfonated polymers 20161-52-8DP, reaction products with sulfonated polymers 102501-86-0DP, 2-Allylphenol-2,6-dimethylphenol copolymer, sodium sulfonated 146673-88-3DP, reaction products with ethylenically unsatd. compds. 163395-54-8DP, reaction products with protonic acid group-containing polymers 210531-46-7DP, reaction products with ethenylphenol 342047-78-3DP, reaction products with ethenylphenol 342047-79-4DP, reaction products with ethenylphenol 515144-35-1P 515144-36-2P 515144-37-3P 515144-38-4P **515144-39-5P 515144-40-8P** 515144-41-9P 515144-42-0P 515144-44-2DP, sulfonated 515144-45-3DP, sulfonated 515144-47-5P 515144-48-6P 515144-51-1DP, reaction products with ethenylbenzoyl chloride **515144-53-3DP**, reaction products with ethenylbenzoyl chloride 515144-58-8P 515144-59-9P 515144-66-8DP, reaction products with ethenylphenol 515144-67-9DP, reaction products with ethenylphenol 515144-68-0DP, reaction products with ethenylphenol 515144-69-1DP, reaction products with ethenylphenol 515144-70-4DP, reaction products with ethylenically unsatd. compds. 515144-71-5DP, reaction products with monoanhydride compds. 515144-72-6DP, reaction products with maleic anhydride 515144-73-7DP, reaction products with allylbenzoic acid, sulfonated 515144-74-8DP, reaction products with allylbenzoic acid, sulfonated 515144-75-9DP, reaction products with ethylenically unsatd. compds.

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(crosslinked; preparation of crosslinkable aromatic resins having protonic acid

groups for ion conductive polymer **membranes**, binders, and **fuel cells**)

IT 51698-33-0P 210531-45-6P 515144-46-4P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)

IT 515144-24-8P 515144-34-0P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(optionally crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)

IT 515144-43-1DP, sulfonated

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polybenzoxazole, crosslinked; preparation of crosslinkable aromatic resins having protonic acid groups for ion conductive polymer **membranes**, binders, and **fuel cells**)

IT 24938-67-8DP, Poly(2,6-dimethyl-1,4-phenylene oxide), sodium sulfonated

267877-35-0DP, reaction products with ethenylphenol 515144-25-9P

515144-26-0P 515144-27-1P **515144-28-2P 515144-29-3P**

515144-30-6P 515144-31-7P 515144-32-8P 515144-33-9P

515144-60-2P 515144-61-3P 515144-62-4P 515144-64-6DP, sulfonated

515144-65-7DP, sulfonated 515811-98-0P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation of crosslinkable aromatic resins having protonic acid groups

for

ion conductive polymer **membranes**, binders, and **fuel cells**)

IT 80-05-7, 2,2-Bis(4-hydroxyphenyl)propane, reactions 80-07-9,
 4,4'-Dichlorodiphenylsulfone 345-92-6, 4,4'-Difluorobenzophenone
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reactant in monomer preparation; preparation of crosslinkable aromatic
 resins

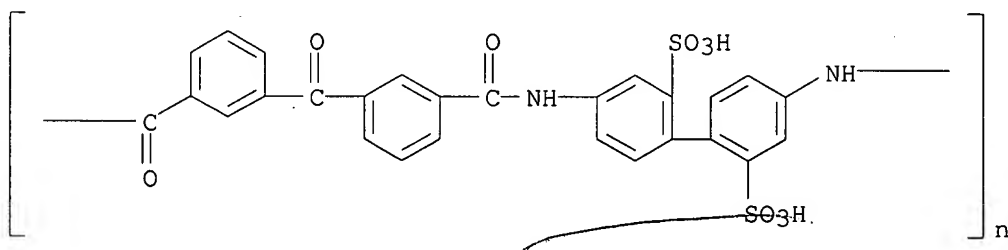
having protonic acid groups for ion conductive polymer
membranes, binders, and **fuel cells**)

IT 515144-53-3P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
 (Properties); TEM (Technical or engineered material use); PREP
 (Preparation); USES (Uses)
 (blend with polyimide; preparation of crosslinkable aromatic resins having
 protonic acid groups for ion conductive polymer **membranes**,
 binders, and **fuel cells**)

RN 515144-53-3 HCAPLUS

CN Poly[imino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-
 phenylenecarbonyl-1,3-phenylenecarbonyl disodium salt] (9CI) (CA INDEX
 NAME)



● 2 Na

IT 515144-39-5P 515144-40-8P 515144-53-3DP,

reaction products with ethenylbenzoyl chloride

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or
 engineered material use); PREP (Preparation); USES (Uses)

(crosslinked; preparation of crosslinkable aromatic resins having protonic
 acid groups for ion conductive polymer **membranes**, binders, and
fuel cells)

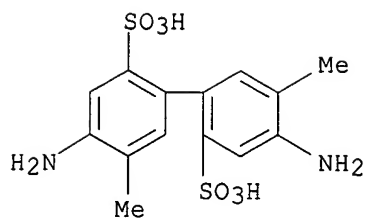
RN 515144-39-5 HCAPLUS

CN [1,1'-Biphenyl]-2,2'-disulfonic acid, 4,4'-diamino-5,5'-dimethyl-,
 disodium salt, polymer with 3,3'-carbonylbis[benzoyl chloride] (9CI) (CA
 INDEX NAME)

CM 1

CRN 67027-35-4

CMF C14 H16 N2 O6 S2 . 2 Na

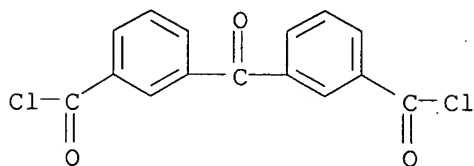


● 2 Na

CM 2

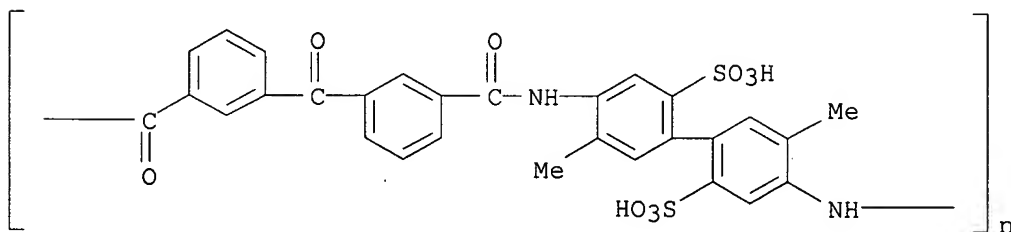
CRN 6472-69-1

CMF C15 H8 Cl2 O3



RN 515144-40-8 HCAPLUS

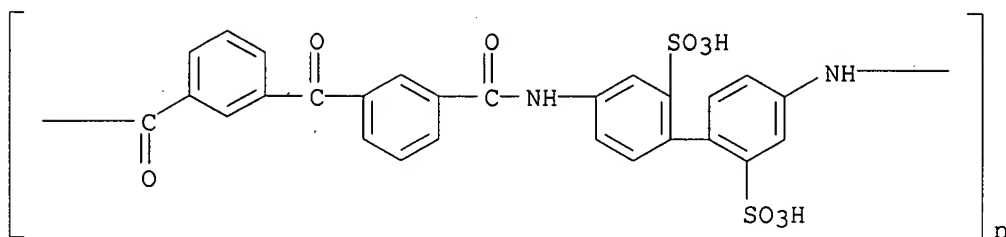
CN Poly[imino(5,5'-dimethyl-2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-phenylenecarbonyl-1,3-phenylenecarbonyl disodium salt] (9CI) (CA INDEX NAME)



● 2 Na

RN 515144-53-3 HCAPLUS

CN Poly[imino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)iminocarbonyl-1,3-phenylenecarbonyl-1,3-phenylenecarbonyl disodium salt] (9CI) (CA INDEX NAME)



● 2 Na

IT 515144-28-2P 515144-29-3P 515144-30-6P

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation of crosslinkable aromatic resins having protonic acid groups

for

ion conductive polymer **membranes**, binders, and **fuel cells**)

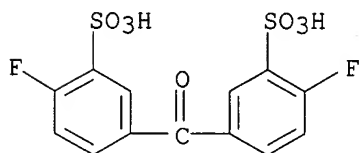
RN 515144-28-2 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer with bis(4-fluorophenyl)methanone and 4,4'-oxybis[2,6-dimethylphenol] (9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

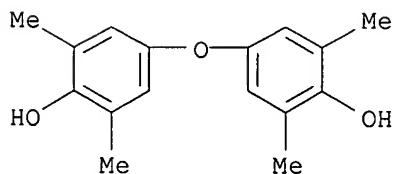


● 2 Na

CM 2

CRN 7378-12-3

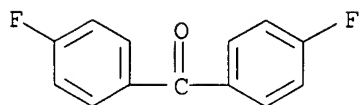
CMF C16 H18 O3



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



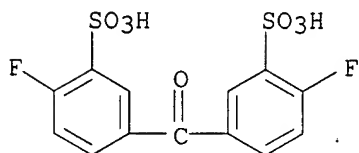
RN 515144-29-3 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer
with bis(4-fluorophenyl)methanone and 4,4'-thiobis[2,6-dimethylphenol]
(9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

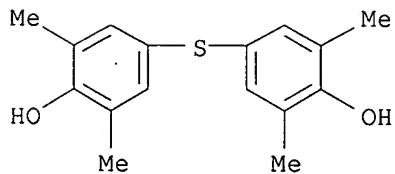


● 2 Na

CM 2

CRN 18525-99-0

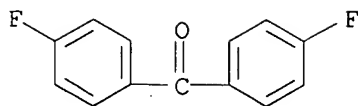
CMF C16 H18 O2 S



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



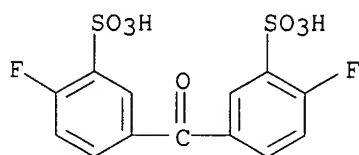
RN 515144-30-6 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer
with bis(4-fluorophenyl)methanone and 4,4'-sulfonylbis[2,6-dimethylphenol]
(9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

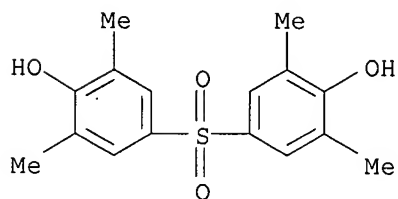


●2 Na

CM 2

CRN 13288-70-5

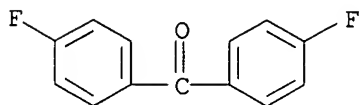
CMF C16 H18 O4 S



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Commissariat A L'Energi	2001			WO 0125312 A	HCAPLUS
Commissariat A L'Energi	2001			JP 2000510511 A	
Commissariat A L'Energi	2001			US 200120082 A	
Commissariat A L'Energi	2001			FR 2799198 A	HCAPLUS
Hoechst Ag	1999			JP 11-502245 A	
Hoechst Ag	1999			WO 9629359 A	HCAPLUS
Kaneka Corp	2002			JP 2002105199 A	HCAPLUS
Kaneka Corp	2002			JP 2002121281 A	HCAPLUS
Sumitomo Electric Indus	2002			JP 2002358978 A	HCAPLUS
Sumitomo Electric Indus	2002			JP 2002367627 A	HCAPLUS
Victrex Manufacturing L	2000			WO 0015691 A	HCAPLUS
Victrex Manufacturing L	2000			JP 2002524631 A	

L132 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:752573 HCAPLUS

DN 137:281852

TI Ion-conducting polymer, **membrane** of the conducting polymer, and **fuel cell**

IN Morizono, Kenichi; Tsukamoto, Koji

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

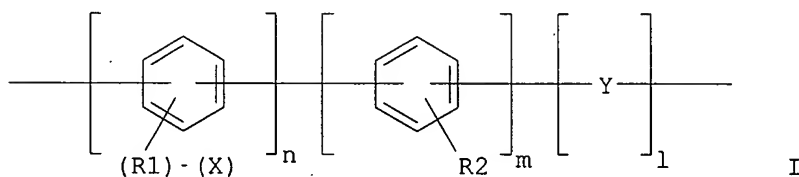
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002289222	A	20021004	JP 2001-88889	20010326 <--
PRAI	JP 2001-88889		20010326	<--	
GI					



AB The polymer has protonic acid groups attached to a polymer main chain via spacer structures having ≥ 1 C atoms. The polymer is preferably I, where R1 and R2 are H or various substituents, Y = single bond, arylene, heteroarylene group, various organic and inorg. groups or a combination thereof; n = integer ≥ 1 , m and l = integer ≥ 0 , and (l+m+n) ≥ 4 . The polymer is useful as electrolyte **membrane** for **fuel cells**.

IC ICM H01M0008-02

ICS C08G0061-10; H01M0008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

ST **fuel cell** electrolyte ion conducting polymer **membrane**

IT **Fuel cell electrolytes**

(structure of proton conducting polymers for electrolyte **membranes in fuel cells**)

IT **466696-81-1P 466696-82-2P 466696-83-3P**
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP
 (Properties); PREP (Preparation); USES (Uses)
 (structure of proton conducting polymers for electrolyte
membranes in fuel cells)

IT **466696-81-1P 466696-82-2P 466696-83-3P**
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP
 (Properties); PREP (Preparation); USES (Uses)
 (structure of proton conducting polymers for electrolyte
membranes in fuel cells)

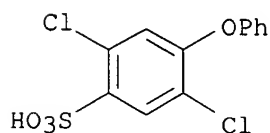
RN 466696-81-1 HCAPLUS

CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with
 dichlorobenzene (9CI) (CA INDEX NAME)

CM 1

CRN 466696-80-0

CMF C12 H8 Cl2 O4 S



CM 2

CRN 25321-22-6

CMF C6 H4 Cl2

CCI IDS



2 (D1-C1)

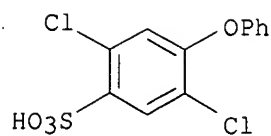
RN 466696-82-2 HCAPLUS

CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with
 (3,4-dichlorophenyl)phenylmethanone (9CI) (CA INDEX NAME)

CM 1

CRN 466696-80-0

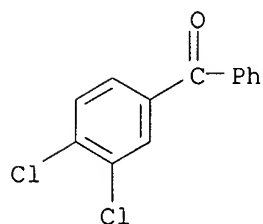
CMF C12 H8 Cl2 O4 S



CM 2

CRN 6284-79-3

CMF C13 H8 Cl2 O



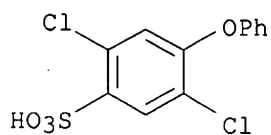
RN 466696-83-3 HCAPLUS

CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with
bis(4-chlorophenyl)methanone (9CI) (CA INDEX NAME)

CM 1

CRN 466696-80-0

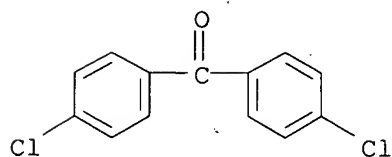
CMF C12 H8 Cl2 O4 S



CM 2

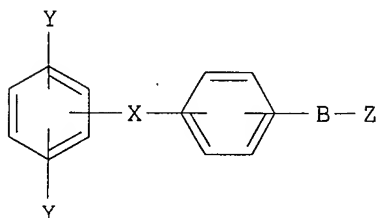
CRN 90-98-2

CMF C13 H8 Cl2 O

L132 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2002:752295 HCAPLUS

DN 137:263435
 TI Monomer containing electron-withdrawing group and electron-donative group,
 and copolymer and proton-conductive **membrane** comprising same
 IN Goto, Kohei; Takahashi, Masayuki; Yamakawa, Yoshitaka; Higami, Makoto
 PA JSR Corporation, Japan
 SO Eur. Pat. Appl., 24 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1245554	A1	20021002	EP 2002-7015	20020327 <--
	EP 1245554	B1	20050126		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	JP 2002293889	A	20021009	JP 2001-99523	20010330 <--
	JP 3698067	B2	20050921		
	CA 2377047	A1	20020930	CA 2002-2377047	20020318 <--
	US 2002177656	A1	20021128	US 2002-105316	20020326 <--
	US 6794480	B2	20040921		
	CN 1379009	A	20021113	CN 2002-108423	20020329 <--
PRAI	JP 2001-99523	A	20010330	<--	
OS	MARPAT 137:263435				
GI					



AB The title monomer is represented by I, wherein Y represents a iodine atom, chlorine atom or bromine atom; X represents an electron-withdrawing group; B represents an electron-donative group; and Z represents an aryl group having a specific structure or a monovalent condensed ring hydrocarbon group such as naphthyl group. 2,5-Dichloro-4'-(4-phenoxyphenoxy)benzophenone was prepared and polymerized with 4,4'-bis (4-chlorobenzoylamino)diphenyl ether, then sulfonated.

IC ICM C07C0049-84
 ICS C08G0061-12; C08J0005-22

CC 35-2 (Chemistry of Synthetic High Polymers)

ST monomer electron withdrawing group; electron donating group monomer; proton conductive **membrane**

IT Monomers
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (monomer containing electron-withdrawing group and electron-donative group, and copolymer and proton-conductive **membrane** comprising same)

IT **Membranes**, nonbiological
 (proton-conductive; monomer containing electron-withdrawing group and electron-donative group, and copolymer and proton-conductive **membrane** comprising same)

IT 463954-51-0P, 4,4'-Bis (4-chlorobenzoylamino)diphenyl

ether-2,5-dichloro-4'-(4-phenoxyphenoxy)benzophenone copolymer

463954-53-2P 463954-54-3P 463954-55-4P

463954-56-5P

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)
(monomer containing electron-withdrawing group and electron-donative group,
and copolymer and proton-conductive **membrane** comprising same)

IT 270903-87-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(monomer containing electron-withdrawing group and electron-donative group,
and copolymer and proton-conductive **membrane** comprising same)

IT 462-06-6, Fluorobenzene 2905-61-5

RL: RCT (Reactant); RACT (Reactant or reagent)
(monomer containing electron-withdrawing group and electron-donative group,
and copolymer and proton-conductive **membrane** comprising same)

IT 463954-50-9P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(monomer; monomer containing electron-withdrawing group and
electron-donative group, and copolymer and proton-conductive
membrane comprising same)

IT 463954-51-0P, 4,4'-Bis (4-chlorobenzoylamino)diphenyl
ether-2,5-dichloro-4'-(4-phenoxyphenoxy)benzophenone copolymer

463954-53-2P 463954-54-3P 463954-55-4P

463954-56-5P

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)
(monomer containing electron-withdrawing group and electron-donative group,
and copolymer and proton-conductive **membrane** comprising same)

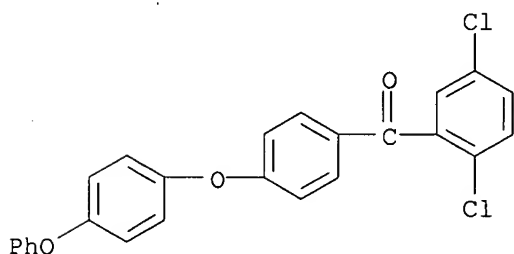
RN 463954-51-0 HCAPLUS

CN Benzamide, N,N'-(oxydi-4,1-phenylene)bis[4-chloro-, polymer with
(2,5-dichlorophenyl)[4-(4-phenoxyphenoxy)phenyl]methanone (9CI) (CA INDEX
NAME)

CM 1

CRN 463954-50-9

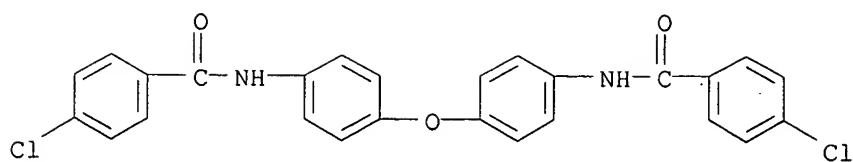
CMF C25 H16 Cl2 O3



CM 2

CRN 63839-12-3

CMF C26 H18 Cl2 N2 O3

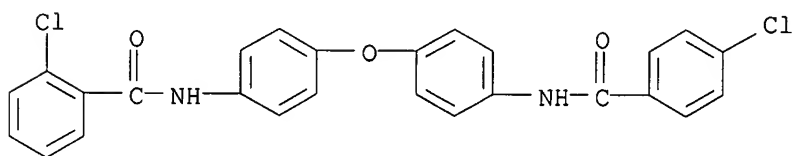


RN 463954-53-2 HCAPLUS
 CN Benzamide, 2-chloro-N-[4-[4-[(4-chlorobenzoyl)amino]phenoxy]phenyl]-, polymer with (2,5-dichlorophenyl)[4-(4-phenoxyphenoxy)phenyl]methanone (9CI) (CA INDEX NAME)

CM 1

CRN 463954-52-1

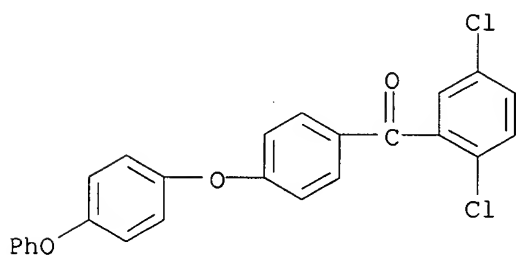
CMF C26 H18 Cl2 N2 O3



CM 2

CRN 463954-50-9

CMF C25 H16 Cl2 O3

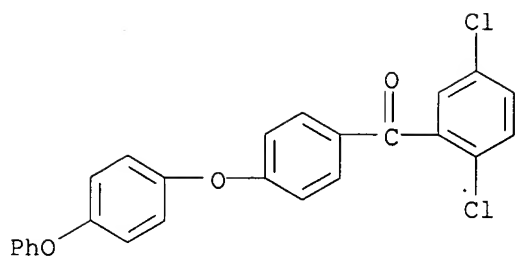


RN 463954-54-3 HCAPLUS
 CN Methanone, (oxydi-4,1-phenylene)bis[(4-chlorophenyl)-, polymer with (2,5-dichlorophenyl)[4-(4-phenoxyphenoxy)phenyl]methanone (9CI) (CA INDEX NAME)

CM 1

CRN 463954-50-9

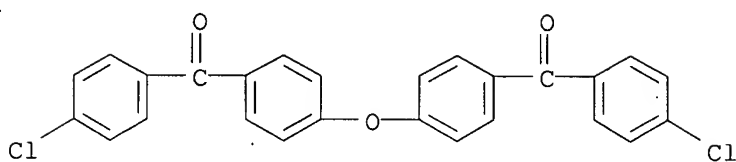
CMF C25 H16 Cl2 O3



CM 2

CRN 63175-37-1

CMF C26 H16 Cl2 O3



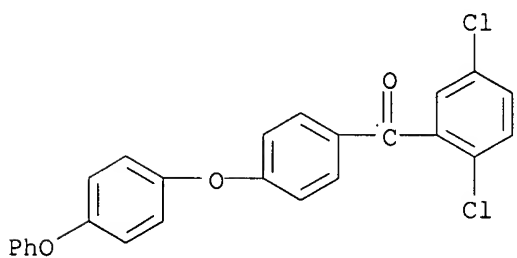
RN 463954-55-4 HCAPLUS

CN Benzamide, N,N'-(oxydi-4,1-phenylene)bis[4-chloro-, polymer with
bis(4-chlorophenyl)methanone and (2,5-dichlorophenyl)[4-(4-
phenoxyphenoxy)phenyl]methanone (9CI) (CA INDEX NAME)

CM 1

CRN 463954-50-9

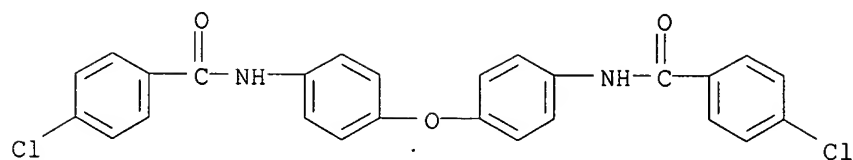
CMF C25 H16 Cl2 O3



CM 2

CRN 63839-12-3

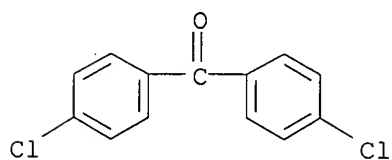
CMF C26 H18 Cl2 N2 O3



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



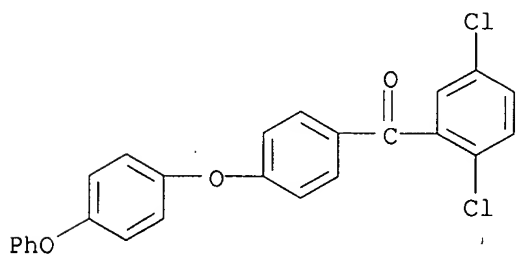
RN 463954-56-5 HCAPLUS

CN Methanone, (oxydi-4,1-phenylene)bis[(4-chlorophenyl)-, polymer with
bis(4-chlorophenyl)methanone and (2,5-dichlorophenyl)[4-(4-
phenoxyphenoxy)phenyl]methanone (9CI) (CA INDEX NAME)

CM 1

CRN 463954-50-9

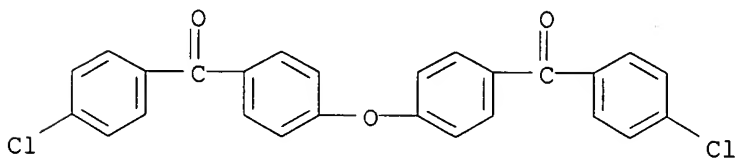
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CM 2

CRN 63175-37-1

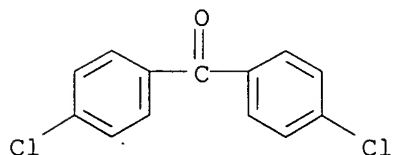
CMF C26 H16 Cl2 O3



CM 3

CRN 90-98-2

CMF C13 H8 Cl2 O



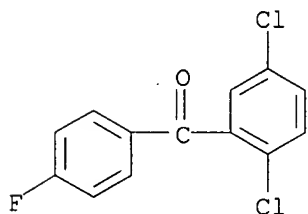
IT 270903-87-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer containing electron-withdrawing group and electron-donative group, and copolymer and proton-conductive **membrane** comprising same)

RN 270903-87-2 HCAPLUS

CN Methanone, (2,5-dichlorophenyl)(4-fluorophenyl)- (9CI) (CA INDEX NAME)



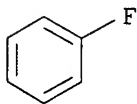
IT 462-06-6, Fluorobenzene 2905-61-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(monomer containing electron-withdrawing group and electron-donative group, and copolymer and proton-conductive **membrane** comprising same)

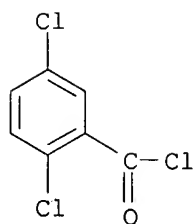
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 2905-61-5 HCAPLUS

CN Benzoyl chloride, 2,5-dichloro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



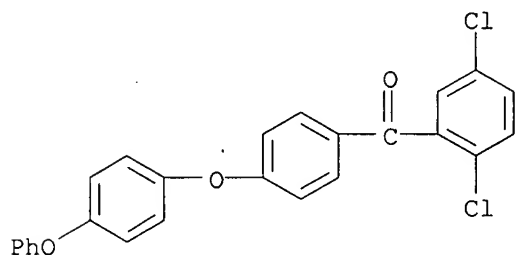
IT 463954-50-9P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(monomer; monomer containing electron-withdrawing group and electron-donative group, and copolymer and proton-conductive membrane comprising same)

RN 463954-50-9 HCAPLUS

CN Methanone, (2,5-dichlorophenyl)[4-(4-phenoxyphenoxy)phenyl]- (9CI) (CA INDEX NAME)



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Jsr Corp	2001			EP 1138712 A	HCAPLUS
Rikukawa, M	1995			US 5403675 A	HCAPLUS

L132 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:734278 HCAPLUS

DN 137:281809

TI Ion-conducting polymer membrane for fuel cell and the fuel cell

IN Fujiyama, Akiko; Kuroki, Takashi; Omi, Katsuhiko; Tamai, Masashi

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

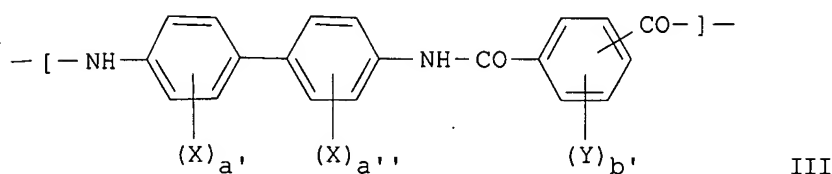
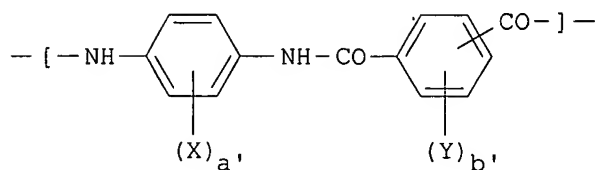
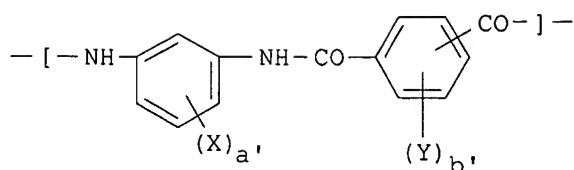
CODEN: JKXXAF

DT Patent

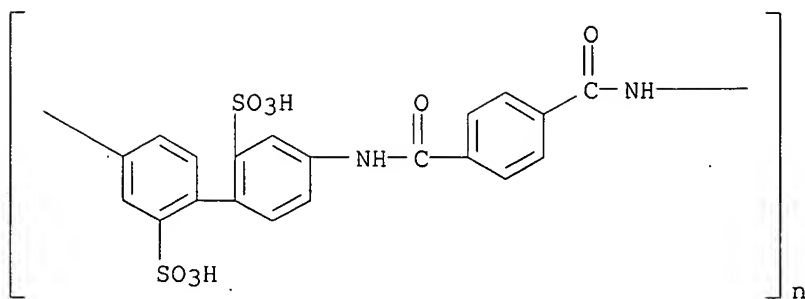
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002280019	A	20020927	JP 2001-77307	20010316 <--
PRAI	JP 2001-77307		20010316	<--	
GI					



- AB The **membrane** is a protonic acid group containing polyamide of repeating units $[-\text{NHA}(\text{X})\text{aNHCOB}(\text{Y})\text{bCO}-]$, where A and B are aromatic rings, X and Y are protonic acid groups selected from sulfonic, carboxylic, phosphoric, or sulfonimide groups, a and b are integers, $(a+b) \geq 1$, and H may be replaced by (halogenated) alkyl groups or halogen. The monomers are preferably selected from I, II, where a' and $b' = 1-4$ integer and $1 \leq (a'+b') \leq 8$, or III where $a'' = 1-4$ and $1 \leq (a'+a''+b') \leq 12$.
- IC ICM H01M0008-02
ICS C08G0069-32; C08J0005-22; H01M0008-10; B01J0039-18; B01J0047-12; C08L0077-10
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST **fuel cell** ion conductive polyamide electrolyte compn
- IT **Fuel cell electrolytes**
(compns. of protonic acid group containing ion-conducting arom polyamide electrolyte **membranes** for **fuel cells**)
- IT Polyamides, uses
RL: DEV (Device component use); USES (Uses)
(compns. of protonic acid group containing ion-conducting arom polyamide electrolyte **membranes** for **fuel cells**)
- IT 76523-11-0 76558-80-0 123375-18-8 **123375-24-6** 124447-51-4
124447-52-5 124564-98-3 124564-99-4
RL: DEV (Device component use); USES (Uses)
(compns. of protonic acid group containing ion-conducting arom polyamide electrolyte **membranes** for **fuel cells**)
- IT **123375-24-6**
RL: DEV (Device component use); USES (Uses)
(compns. of protonic acid group containing ion-conducting arom polyamide electrolyte **membranes** for **fuel cells**)
- RN 123375-24-6 HCAPLUS
- CN Poly[iminocarbonyl-1,4-phenylenecarbonylimino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)] (9CI) (CA INDEX NAME)



L132 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:667405 HCAPLUS

DN 137:202898

TI Structurally rigid anionic polymers as retention and drainage aids in papermaking

IN Ward, William J.; Dunham, Andrew J.; Carter, Phillip W.; Zelenev, Andrei S.

PA Nalco Chemical Company, USA

SO U.S., 12 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6444091	B1	20020903	US 2000-740548	20001220 <--
	WO 2002052102	A2	20020704	WO 2001-US45706	20011129 <--
	WO 2002052102	A3	20020906		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2002245060	A1	20020708	AU 2002-245060	20011129 <--
PRAI	US 2000-740548	A	20001220	<--	
	WO 2001-US45706	W	20011129	<--	
AB	This invention concerns a method of increasing retention and drainage in a papermaking furnish comprising adding to the furnish an effective amount of a structurally rigid anionic condensation polymer prepared from aryldiamines and cyclic carboxylates. A polymer was prepared from benzene-1,4-dicarbonyl chloride and 4,4'-diamino-2,2'-biphenyldisulfonic acid.				
IC	ICM D21H0017-46				
	ICS D21H0021-10				
INCL	162164100				
CC	43-7 (Cellulose, Lignin, Paper, and Other Wood Products)				
IT	Self-assembled monolayers (structurally rigid anionic polymers as retention and drainage aids in papermaking)				
IT	123375-18-8P	123375-24-6P	187938-94-9P	187938-98-3P	
	452311-63-6P	452311-64-7P	452311-65-8P		

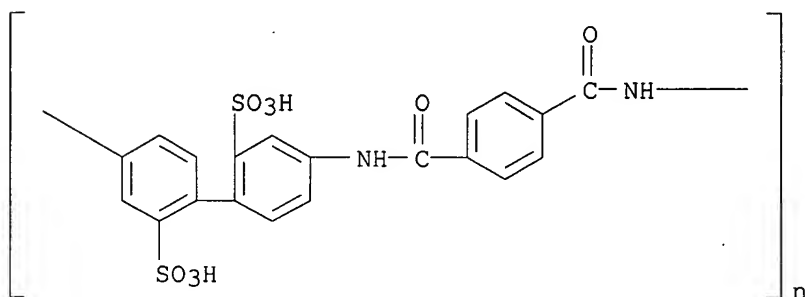
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(structurally rigid anionic polymers as retention and drainage aids in papermaking)

IT 123375-24-6P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(structurally rigid anionic polymers as retention and drainage aids in papermaking)

RN 123375-24-6 HCAPLUS

CN Poly[iminocarbonyl-1,4-phenylenecarbonylimino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)] (9CI) (CA INDEX NAME)



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
=====	=====	=====	=====	=====	=====
Anon	1997			JP 198729251	
Irwin	1993			US 5202410 A	HCAPLUS
Kershner	1989			US 4824916 A	HCAPLUS
Nishihara	1988			US 4749753 A	HCAPLUS
Peiffer	1992			US 5095073 A	HCAPLUS
Sarkar, N	1996	62	393	Journal of Applied P	HCAPLUS
Stockwell	1998			US 5733414 A	HCAPLUS

L132 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:626704 HCAPLUS

DN 137:338315

TI Synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**

AU Wiles, K. B.; Bhanu, V. A.; Wang, F.; McGrath, J. E.

CS Dept. of Chemistry and Materials Res. Inst., Virginia Polytechnic Inst. and State Univ., Blacksburg, VA, 24061, USA

SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 993-994

CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal; (computer optical disk)

LA English

AB Sulfonated poly(arylene sulfide sulfone) copolymers were successfully synthesized at the 30 and 40 % targeted degrees of sulfonation by direct copolymn. of 4,4'-difluorodiphenyl sulfone, 4,4'-thiobisbenzenethiol, and sulfonated 4,4'-difluorodiphenyl sulfone. Tough, acid form films were produced when cast from solution NMR data suggested that the observed degree of sulfonation matched well with the targeted feed values. Characterization by TGA confirmed the thermal stability of these copolymers. Boiling of the

films in sulfuric acid converted the salt form films to the acid form films and demonstrated the chemical resistance of the copolymers.

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 38

ST polysulfide polysulfone proton exchange **membrane** prepn

IT Polysulfones, preparation

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfide-; synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

IT Polysulfides

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polysulfone-; synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

IT Ionic conductivity

(proton; synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

IT **Membranes**, nonbiological

Viscosity

(synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

IT **474242-19-8P**

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

IT **474242-19-8P**

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(synthesis and characterization of sulfonated poly(arylene sulfide sulfone) copolymers as candidates for proton exchange **membranes**)

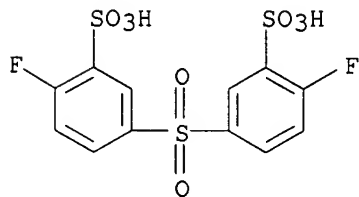
RN 474242-19-8 HCAPLUS

CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-fluoro-, polymer with 1,1'-sulfonylbis[4-fluorobenzene] and 4,4'-thiobis[benzenethiol] (9CI) (CA INDEX NAME)

CM 1

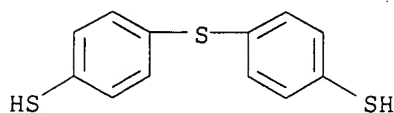
CRN 474242-18-7

CMF C12 H8 F2 O8 S3



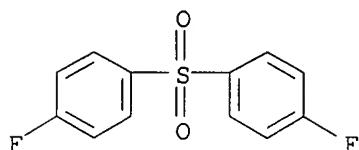
CM 2

CRN 19362-77-7
CMF C12 H10 S3



CM 3

CRN 383-29-9
CMF C12 H8 F2 O2 S



RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Allam, C	1999	200	1854	Macromol Chem Phys	HCAPLUS
Hickner, M	2001			Proceedings of the A	
Jacoby, M	1999	77	31	C&E News	
Liu, Y	2000	41	5137	Polymer	HCAPLUS
McGrath, J	1999	83	342	PMSE Preprints	
Seo, K	1997	38	4547	Polymer	HCAPLUS
Wang, F	2002	197	231	J Membrane Sci	HCAPLUS
Wang, F	2000	41	416	Polymer Preprints	
Zawodzinski, T	1991	95	6040	J Phys Chem	HCAPLUS

L132 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:573532 HCAPLUS

DN 137:127567

TI Composite polymer electrolyte **membrane** and its manufacture

IN Asano, Yoichi; Kanaoka, Osayuki; Saito, Nobuhiro; Soma, Hiroshi; Nanaumi, Masaaki

PA Honda Motor Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

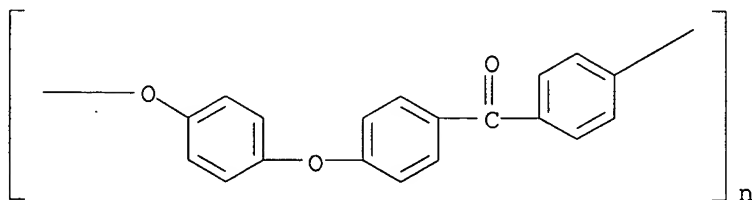
DT Patent

LA Japanese

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002216800	A	20020802	JP 2001-12490	20010119 <--
	JP 3442741	B2	20030902		
	DE 10201691	A1	20020905	DE 2002-10201691	20020117 <--
	US 2002164513	A1	20021107	US 2002-50134	20020118 <--
	US 6926984	B2	20050809		
	CA 2368787	A1	20020719	CA 2002-2368787	20020121 <--
	US 2005260474	A1	20051124	US 2005-110695	20050421 <--

US 2005260475 A1 20051124 US 2005-110696 20050421 <--
 PRAI JP 2001-12490 A 20010119 <--
 JP 2001-97802 A 20010330 <--
 US 2002-50134 A3 20020118 <--
 AB The electrolyte **membrane**: has a high ion exchange capacity
 sulfonated polymer reinforced by fibrous or porous film low ion exchange
 capacity sulfonated polymer, and is prepared by casting a mixture containing
 the fibrous material dispersed uniformly in the high ion exchange capacity
 polymer solution, or impregnating the porous film with the high ion exchange
 polymer solution Both polymers have the same skeleton, which is a nonfluoro
 sulfonated polymer containing phenylene group, preferably a polyether ether
 ketone. The low ion exchange capacity polymer has part of its sulfonate
 groups in a Na⁺ salt form.
 IC ICM H01M0008-02
 ICS C08J0005-04; C08J0005-22; H01B0001-06; C08L0071-00; C08L0101-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST ion exchange nonfluoro sulfonated polymer composite electrolyte
fuel cell; fuel cell sulfonated
 polymer electrolyte ion exchange capacity
 IT **Fuel cell electrolytes**
 (sulfonated nonfluoro polymer ion exchange electrolyte **membrane**
 reinforced with low ion exchange capacity polymers for **fuel**
cell)
 IT **31694-16-3D**, sulfonated
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PROC (Process); USES (Uses)
 (sulfonated nonfluoro polymer ion exchange electrolyte **membrane**
 reinforced with low ion exchange capacity polymers for **fuel**
cell)
 IT **31694-16-3D**, sulfonated
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PYP (Physical process); PROC (Process); USES (Uses)
 (sulfonated nonfluoro polymer ion exchange electrolyte **membrane**
 reinforced with low ion exchange capacity polymers for **fuel**
cell)
 RN 31694-16-3 HCAPLUS
 CN Poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA
 INDEX NAME)



L132 ANSWER 21 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2002:571485 HCAPLUS

DN 137:143007

TI Polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell

IN Asano, Yoichi; Nanaumi, Masaaki; Kanaoka, Nagayuki; Sohma, Hiroshi; Saito,
 Nobuhiro; Matsuo, Junji; Goto, Kohei; Takahashi, Masayuki; Naito, Yuji;
 Masaka, Fusazumi

PA Honda Giken Kogyo K.K., Japan; JSR Corporation

SO Ger. Offen., 40 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10201886	A1	20020801	DE 2002-10201886	20020118 <--
	JP 2002216797	A	20020802	JP 2001-12361	20010119 <--
	JP 3412762	B2	20030603		
	JP 2002216798	A	20020802	JP 2001-12362	20010119 <--
	JP 3412763	B2	20030603		
	JP 2002216790	A	20020802	JP 2001-12363	20010119 <--
	JP 3411562	B2	20030603		
	JP 2002216799	A	20020802	JP 2001-12489	20010119 <--
	JP 3481593	B2	20031222		
	CA 2368669	A1	20020719	CA 2002-2368669	20020121 <--
	US 2002172850	A1	20021121	US 2002-51199	20020122 <--
	US 6933068	B2	20050823		
PRAI	JP 2001-12361	A	20010119	<--	
	JP 2001-12362	A	20010119	<--	
	JP 2001-12363	A	20010119	<--	
	JP 2001-12489	A	20010119	<--	

AB A polymer composite electrolyte **membrane** is formed from a first polymer electrolyte comprising a sulfonated polyarylene polymer and a second polymer electrolyte comprising an another hydrocarbon polymer electrolyte. The first polymer electrolyte consists of 2-70 mol% of an aromatic compound unit with an electron-attractive group in its main chain, while 30-98 mol% of it consist of an aromatic compound unit without electron-attractive group in the main chain. The second polymer electrolyte is a sulfonated polyether electrolyte or a sulfonated polysulfide electrolyte. The polymer composite electrolyte **membrane** is formed from a matrix, which covers the first polymer electrolyte, selected from sulfonated polyarylene polymers, and contains an ion exchange capacity of >1.5 meq/g, but <3.0 meq/g, which is carried on a reinforcement; the second polymer electrolyte has an ion exchange capacity of >0.5 meq/g, but <1.5 meq/g. The polymer electrolyte **membrane** covers a polyarylene polymer, which is so sulfonated that the Q-value lies within the range of 0.09-0.18 C/cm².

IC ICM H01M0008-02

ICS B01D0071-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38ST **fuel cell** polymer composite electrolyte
membrane

IT Polymers, uses

RL: DEV (Device component use); USES (Uses)

(aromatic, sulfonated; polymer electrolyte **membrane** and solid polymer electrolyte **fuel cell**)

IT Ion exchange

(capacity; polymer electrolyte **membrane** and solid polymer electrolyte **fuel cell**)

IT Silicates, uses

RL: MOA (Modifier or additive use); USES (Uses)

(phyllo-; polymer electrolyte **membrane** and solid polymer electrolyte **fuel cell**)

IT Polyketones

RL: DEV (Device component use); USES (Uses)

(polyether-, sulfonated; polymer electrolyte **membrane** and solid polymer electrolyte **fuel cell**)

IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)
(polyketone-, sulfonated; polymer electrolyte **membrane** and
solid polymer electrolyte **fuel cell**)

IT **Membranes**, nonbiological
Polymer electrolytes
(polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell)

IT Hydrocarbons, uses
RL: DEV (Device component use); USES (Uses)
(polymers, sulfonated; polymer electrolyte **membrane** and solid
polymer electrolyte **fuel cell**)

IT **Fuel cells**
(solid electrolyte; polymer electrolyte **membrane** and solid
polymer electrolyte **fuel cell**)

IT Polyethers, uses
Polyoxyphenylenes
Polysulfides
Polythiophenylenes
RL: DEV (Device component use); USES (Uses)
(sulfonated; polymer electrolyte **membrane** and solid polymer
electrolyte **fuel cell**)

IT **7440-06-4, Platinum**, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell)

IT **151173-26-1P 364062-39-5P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell)

IT **7440-06-4, Platinum**, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell)

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

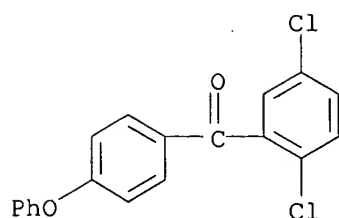
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IT **151173-26-1P 364062-39-5P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(polymer electrolyte **membrane** and solid polymer electrolyte
fuel cell)

RN 151173-26-1 HCAPLUS
CN Methanone, (2,5-dichlorophenyl)(4-phenoxyphenyl)-, homopolymer (9CI) (CA
INDEX NAME)

CM 1

CRN 151173-25-0
CMF C19 H12 C12 O2



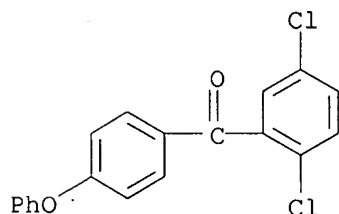
RN 364062-39-5 HCAPLUS

CN Methanone, bis(4-chlorophenyl)-, polymer with (2,5-dichlorophenyl)(4-phenoxyphenyl)methanone (9CI) (CA INDEX NAME)

CM 1

CRN 151173-25-0

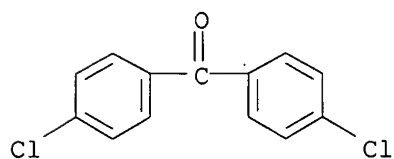
CMF C19 H12 Cl2 O2



CM 2

CRN 90-98-2

CMF C13 H8 Cl2 O



L132 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 2001:153275 HCAPLUS

DN 134:296189

TI Novel sodium sulfonate-functionalized poly(ether ether ketone)s derived from 4,4'-thiodiphenol

AU Liu, Shengzhou; Chen, Tianlu

CS Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China

SO Polymer (2001), 42(7), 3293-3296

CODEN: POLMAG; ISSN: 0032-3861

PB Elsevier Science Ltd.

DT Journal

LA English

AB Sodium sulfonate-functionalized poly(ether ether ketone)s derived from 4,4'-thiodiphenol with degree of sulfonation up to 2.0 were synthesized by nucleophilic polycondensation of various amount of 5,5'-carbonylbis(2-fluorobenzene-sulfonate) and 4,4'-difluorobenzophenone with 4,4'-thiodiphenol. The composition and structure of the polymers were confirmed by IR and NMR spectroscopies, and elemental anal. Wide angle x-ray diffraction patterns indicated an amorphous structure of the polymers. All the polymers showed excellent thermal stability and poor solubility in water. The polymers are of interest for use as high performance gas dehumidification and ion exchange **membranes**.

CC 35-5 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36

IT Polymerization
(nucleophilic; preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

IT Polythioethers
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polyketone-, aromatic, sulfonate-containing; preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

IT Polyketones
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polythioether-, aromatic, sulfonate-containing; preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

IT Polyelectrolytes
Solubility
Thermal stability
(preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

IT **334658-51-4P**, Disodium 5,5'-Carbonylbis(2-fluorobenzenesulfonate)-4,4'-difluorobenzophenone-4,4'-thiodiphenol copolymer
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

IT **334658-51-4P**, Disodium 5,5'-Carbonylbis(2-fluorobenzenesulfonate)-4,4'-difluorobenzophenone-4,4'-thiodiphenol copolymer
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and thermal stability and solubility of sodium sulfonate-poly(thioether ketone)s for separation **membranes**)

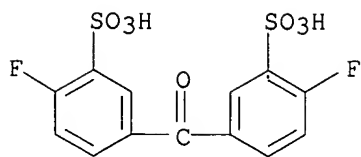
RN 334658-51-4 HCAPLUS

CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer with bis(4-fluorophenyl)methanone and 4,4'-thiobis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 210531-45-6

CMF C13 H8 F2 O7 S2 . 2 Na

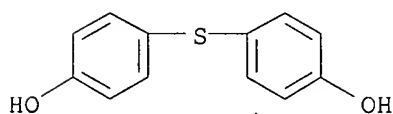


● 2 Na

CM 2

CRN 2664-63-3

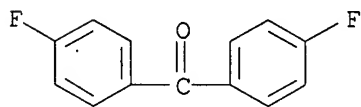
CMF C12 H10 O2 S



CM 3

CRN 345-92-6

CMF C13 H8 F2 O



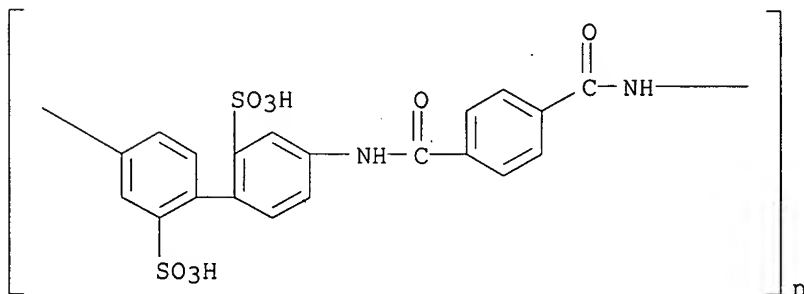
RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bailly, C	1987	28	1009	Polymer	HCAPLUS
Bishop, M	1985	18	86	Macromolecules	HCAPLUS
Fu, H	1994	51	1405	J Appl Polym Sci	HCAPLUS
Hird, B	1992	25	6466	Macromolecules	HCAPLUS
Jia, L	1996	60	1231	J Appl Polym Chem	HCAPLUS
Jin, X	1985	17	4	Br Polym J	HCAPLUS
Johnson, B	1984	22	721	J Polym Sci, Polym C	HCAPLUS
Litter, M	1985	23	2205	J Polym Sci, Polym C	HCAPLUS
Liu, S	2000		12	Chem J Chinese Univ	HCAPLUS
Nolte, R	1993	89	211	J Membr Sci	
Noshay, A	1976	20	1885	J Appl Polym Sci	HCAPLUS
Ueda, M	1993	31	853	J Polym Sci, Polym C	HCAPLUS
Wang, F	1998	199	1421	Macromol Chem Phys	HCAPLUS
Wang, F	1998	19	135	Macromol Rapid Commu	HCAPLUS
Wang, F	1999	40	1795	Polymer	HCAPLUS

L132 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 1997:655671 HCAPLUS
DN 127:319714
TI Pervaporation properties of selective **layers** based on
sulfonate-containing poly(phenylene phthalamides): Effect of the
configurational chain structure and nature of counterions on pervaporation
separation of aqueous-organic mixtures
AU Kirsh, Yu. E.; Vdovin, P. A.; Fedotov, Yu. A.; Platonov, K. N.; Smirnova,
N. N.; Zemlyanova, O. Yu.; Timashev, S. F.
CS Gos. Nauchnyi Tsentr Ross. Federatsii, Nauchno-Issled. Fiz.-Khim. Inst.
im. Karpova, Moscow, 103064, Russia
SO Vysokomolekulyarnye Soedineniya, Seriya A i Seriya B (1997),
39(5), 890-895
CODEN: VSSBEE; ISSN: 1023-3091
PB MAIK Nauka
DT Journal
LA Russian
AB For the **membrane** based on sulfonate-containing aromatic polyamides,
pervaporation separation of water from water-alc. mixts. was investigated. The
selectivity and permeability of the **membranes** were studied as a
function of the composition of the selective **layer** and the nature of
counterion of the sulfo acid group. The composition of the selective
layer was controlled by varying the ratio between terephthalic and
isophthalic acid chlorides in the polymer chain. The selective
layer based on polyamides containing equal molar fractions of
terephthalic and isophthalic components was shown to be characterized by
maximum selectivity and permeability. The selectivity coefficient depends on
the
nature of the counterion and increases in the following order: $\text{Na}^+ < \text{K}^+ < \text{Cs}^+ < \text{N}^+ (\text{C}_2\text{H}_5)_4 \leq \text{poly(ethylenimine)}$. In the last case, the
selectivity coefficient (the ratio between the molar fractions of the water and
solvent in the permeate) was equal to 5.5×10^3 for the pervaporation
separation of water-butanol mixture. The diffusion coefficient of water and its
dependence on partial water vapor pressure were found to be determined by a
configurational chain structure.
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37
ST sulfonate contg polyphthalamide pervaporation **membrane**
selectivity; counter ion polyphthalamide pervaporation **membrane**
selectivity; chain structure polyphthalamide pervaporation
membrane selectivity; alc water sepn polyphthalamide pervaporation
membrane
IT Polyamides, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(aromatic, sulfonate group-containing; pervaporation properties of selective
layers based on sulfonate-containing poly(phenylene phthalamides))
IT **Membranes**, nonbiological
Membranes, nonbiological
(permselective, pervaporation; pervaporation properties of selective
layers based on sulfonate-containing poly(phenylene phthalamides))
IT Diffusion
(pervaporation properties of selective **layers** based on
sulfonate-containing poly(phenylene phthalamides))
IT Polyelectrolytes
RL: DEV (Device component use); POF (Polymer in formulation); PRP
(Properties); USES (Uses)
(pervaporation properties of selective **layers** based on
sulfonate-containing poly(phenylene phthalamides))
IT Alcohols, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(pervaporation properties of selective **layers** based on

IT sulfonate-containing poly(phenylene phthalamides))
 Cations
 RL: PRP (Properties)
 (pervaporation properties of selective **layers** based on
 sulfonate-containing poly(phenylene phthalamides))
 IT 123375-18-8 123375-20-2 **123375-24-6** 123375-25-7
 RL: DEV (Device component use); POF (Polymer in formulation); PRP
 (Properties); USES (Uses)
 (pervaporation properties of selective **layers** based on
 sulfonate-containing poly(phenylene phthalamides))
 IT 129434-95-3 132613-77-5 136475-74-6 136796-38-8 197580-48-6
 197580-51-1 197580-52-2 197580-54-4 197580-56-6 197580-57-7
 197580-58-8 200009-76-3
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (pervaporation properties of selective **layers** based on
 sulfonate-containing poly(phenylene phthalamides))
 IT 64-17-5, Ethanol, processes 67-63-0, Isopropanol, processes 71-36-3,
 1-Butanol, processes 7732-18-5, Water, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (pervaporation properties of selective **layers** based on
 sulfonate-containing poly(phenylene phthalamides))
 IT **123375-24-6**
 RL: DEV (Device component use); POF (Polymer in formulation); PRP
 (Properties); USES (Uses)
 (pervaporation properties of selective **layers** based on
 sulfonate-containing poly(phenylene phthalamides))
 RN 123375-24-6 HCAPLUS
 CN Poly[iminocarbonyl-1,4-phenylenecarbonylimino(2,2'-disulfo[1,1'-biphenyl]-
 4,4'-diyl)] (9CI) (CA INDEX NAME)



L132 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 2007 ACS on STN

AN 1989:575358 HCAPLUS

DN 111:175358

TI Water-soluble, crosslinkable, sulfonated aromatic polyamides

IN Kershner, Larry D.; Reineke, Charles E.; Sarkar, Nitis; Wilson, Larry R.

PA Dow Chemical Co., USA

SO U.S., 9 pp. Cont.-in-part of U.S. Ser. No. 708,608, abandoned.

CODEN: USXXAM

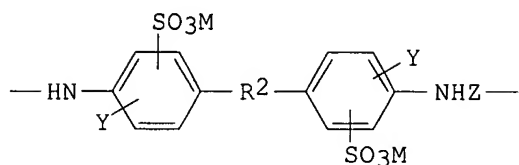
DT Patent

LA English

FAN.CNT 1

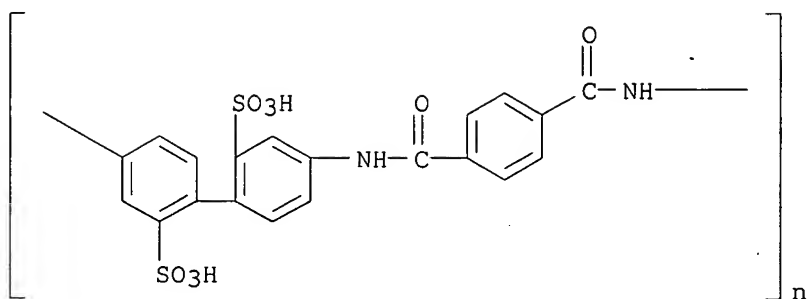
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4824916	A	19890425	US 1986-885357	19860714 <--
	US 4895660	A	19900123	US 1989-333375	19890405 <--

PRAI US 1985-708608 A2 19850315 <--
 US 1986-885357 A3 19860714 <--
 GI



AB Title polyamides, useful as **membranes**, thickeners, coatings, and adhesives, comprise I [Y = compatible substituent; M+ = compatible cation; R2 = covalent bond, hydrocarbylene, or substituted hydrocarbylene; Z = CO, COR1CO, SO2R1SO2; R1 = (un)substituted hydrocarbylene] repeating units and are prepared by solution or interfacial polymerization A film from a copolymer prepared by stirring 1.2738 g terephthaloyl chloride in 100 mL CHCl3 solution into a mixture of 100 mL CHCl3, 250 mL H2O, 2.65 g Na2CO3, 2.1523 g 4,4'-diaminobiphenyl-2,2'-disulfonic acid, and 2 g polyethylene glycol diisostearate, had permselectivity (for water) 60 and permeation rate 100 for 90:10 EtOH-water mixture

IC ICM C08G0069-48
 INCL 525420000
 CC 37-3 (Plastics Manufacture and Processing)
 ST diaminobiphenyldisulfonic acid polyamideurea adhesive; coating diaminobiphenyldisulfonic acid polyamideurea polymn; thickener diaminobiphenyldisulfonic acid polyamideurea polymn; **membrane** diaminobiphenyldisulfonic acid polyamideurea polymn
 IT Crosslinking agents
 (for polyamideureas, in adhesives, coatings, **membranes**, and thickening agents)
 IT **Membranes**
 (for separation, polyamideureas, preparation of)
 IT Polysulfones, uses and miscellaneous
 RL: USES (Uses)
 (laminates, with polyamideurea, for separation **membranes**)
 IT 123375-18-8P 123375-19-9P 123375-20-2P **123375-24-6P**
 123391-12-8P
 RL: PREP (Preparation)
 (manufacture of, water-soluble and crosslinkable)
 IT 67383-14-6, Millipore PTGC 123339-95-7, UF 10
 RL: USES (Uses)
 (**membranes**, laminated with polyamideurea, for separation **membranes**)
 IT **123375-24-6P**
 RL: PREP (Preparation)
 (manufacture of, water-soluble and crosslinkable)
 RN 123375-24-6 HCAPLUS
 CN Poly[iminocarbonyl-1,4-phenylenecarbonylimino(2,2'-disulfo[1,1'-biphenyl]-4,4'-diyl)] (9CI) (CA INDEX NAME)



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